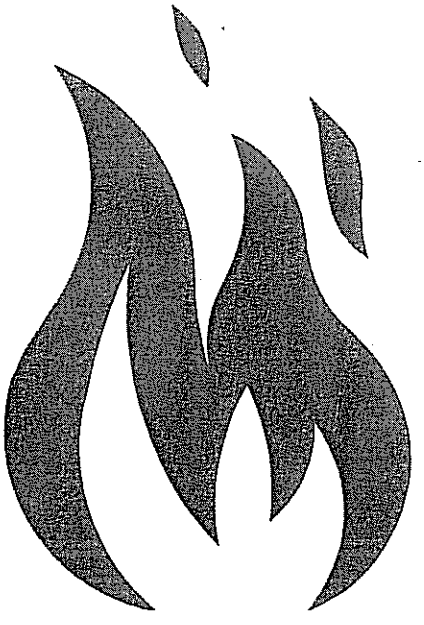
FIRE PRECAUTIONS FOR HOUSES IN MULTIPLE OCCUPATION

A Practical and Technical Guide



Chartered
Institute of
Environmental
Health

CONTENTS

INTRODUCTION

CONTEXT

This guide is intended to provide details on the practical and technical means of achieving adequate fire precautions for Houses in Multiple Occupation. It does not seek to interpret the current standard recommended by the Department of the Environment or to supply policies in this area of work. The current standard is Circular 12/92 which is referred to in this guide as 'The current HMO Code of Practice."

INTENDED READERSHIP

The guide was designed to meet the needs of Environmental Health practitioners dealing with Fire Precautions in Houses in Multiple Occupation. However, it will provide a definitive reference source for all involved in fire precautions work including surveyors, contractors, landlords and industry providers.

THE PROBLEM

In 1994 the Chartered Institute of Environmental Health (C.I.E.H.) perceived that the technical requirements for fire precautions in Houses in Multiple Occupation were complex and wide ranging. They were contained in a large number of British Standards, Codes of Practice, Industry Guides and Regulations. It was recognised that there was no single definitive reference source to enable the effective and consistent application of standards.

THE SOLUTION

In order to fill this gap in technical guidance the CIEH set up a working group to research technical standards and draft a single definitive manual on fire precaution standards in HMOs which could be applied on a London-wide basis. The group comprised the following officers :

Richard Drew	Royal Borough of Kensington and Chelsea
Kevin Thompson	Royal Borough of Kensington and Chelsea
Judith Harris	London Borough of Camden
Sheila Brass	London Borough of Wandsworth
Karen Sinclair	London Borough of Richmond upon Thames
Karen Weeks	London Borough of Hounslow
Bryan Pope	London Fire Brigade

PUBLIC/PRIVATE PARTNERSHIP

The draft text of the guide was sent to a wide range of companies in the fire protection industry along with a select group of nationally respected independent fire consultants. Only when full consensus was reached was the final text put to print. The response from the industry was overwhelming and the officers concerned are confident that the final text will receive the approval of both the enforcing Authorities and the Industry providers.

AIMS & OBJECTIVES

The document is intended to :

- Ensure a high level of technical expertise amongst enforcement officers
- Bring about uniformity in standards across London, thereby reducing the burden on business
- Ensure excellence in fire safety for HMO residents

THE FUTURE

The guide is intended to be a living document. Standards are constantly under review as technology advances and greater harmonisation across the European Union comes about. The current HMO Code of Practice (DOE Circular 12/92) is under review.

In line with this the Working Group will re-convene as necessary to review and amend the guide.

The final text of this guide was produced by Richard Drew and Kevin Thompson at the Royal Borough of Kensington and Chelsea. Comments or suggestions are positively welcomed by them at :

Council Offices, Royal Borough of Kensington and Chelsea
37 Pembroke Road, London W8 6PW
Tel. No: 0171-341-5690/5663
Fax. No : 0171-341-5234

E-Mail : DEHMOE@RBKC.gov.uk

"The Chartered Institute of Environmental Health has reviewed this publication for use by practitioners involved in ensuring that houses in multiple occupation are as far as possible fire safe. The Chartered Institute full endorses this guide and commends its use in the London Boroughs. It is hoped that councils across the country will also consider adopting this guide for use in their respective districts."

Peter Archer
Chair of the Housing Committee of the
Chartered Institute of Environmental Health

"The London Fire Brigade welcomes the publication of a technical guide and its use in the Greater London area will undoubtedly assist in achieving appropriate fire safety levels in Houses in Multiple Occupation. The Brigade is also pleased to have been asked to contribute to the formulation of its technical content."

M. A. Smith
Assistant Chief Fire Officer
Fire Safety Department
LFCDA

ACKNOWLEDGEMENTS

The authors of this guide would like to thank the following companies and trade associations without whose financial assistance this guide could not have been produced. We would also like to record our thanks to their technical staff who provided additional advice and support.

Notifier Ltd who underwrote the costs, Abel Alarm Co. Ltd., Apollo Fire Detectors Ltd., British Gypsum Ltd., Chubb Fire Ltd., Delta Special Cables Ltd, DORMA Door Controls Ltd., John Carr Ltd., Promat Fire Protection Ltd., Rockwool Ltd., Sealmaster Ltd., Stocksigns Ltd., Fire Resisting Glass and Glazed Systems Association (FRGGSA), Glass and Glazing Federation and fire consultants Peter Jackman, Norman England and Lin Parry who gave us a considerable amount of their time free.

We would also like to thank the Chartered Institute of Environmental Health (C.I.E.H), the London Fire and Civil Defence Authority (LFCDA) and the following companies and trade associations who provided valuable technical advice.

AEI Cables Ltd., British Gas Transco., Cape Boards Ltd., Chiltern International Fire Ltd., Datwyler Ltd., Josiah Parkes Ltd., Menvier (Electronic Engineers) Ltd., NT Door Controls Ltd., Nullifire Ltd., Pilkington (United Kingdom) Ltd., Quelfire Ltd., Sensotec Europe Ltd., Signs and Labels Ltd., 3M United Kingdom Ltd., the Architectural and Specialist Door Manufacturers Association (ASDMA), the Association for Specialist Fire Protection (ASFP), the Association of Builders Hardware Manufacturers (ABHM) who also kindly took the trouble to review the whole of the Door Hardware section and subsequently endorsed it. The British Fire Protection Systems Association (BFPSA) who reviewed the whole of the AFD and Emergency Lighting Sections and provided valuable comments. The Guild of Architectural Ironmongery (GIA)., and the Timber Research and Development Association (TRADA).

Richard Drew and Kevin Thompson would also like to thank the management and staff of the Royal Borough of Kensington and Chelsea without whose patience and encouragement this guide may never have been produced!!

Lastly we would like to thank Linda Williams who proof read the whole document and John and Christina Clark at Ryecroft Data for their assistance and patience whilst the guide was being designed and prepared for printing.

Design, Artwork & Print by:
Ryecroft Data, The Way, High Street, Fowlmere, Royston, Herts SG8 7SU
Tel : 01763-208640

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CEILINGS

1.0 INTRODUCTION

1.1 The current ***HMO Code of Practice*** gives details about the level of fire resistance required in every circumstance and reference must be made to that document. However, in practice, fire resistance, when tested to BS 476 : Part 8 : 1972 or Parts 21-23 : 1987, will be restricted to 30 minutes and 60 minutes in HMO's.

In general, 30 minute fire resisting construction will be required in the following circumstances :-

- Ceilings under protected routes including soffits to cupboards under stairs and the underside of the ground floor passage if leading to a ***final exit***
- Ceilings between residential accommodation

In general, 60 minute fire resisting construction will be required in the following circumstances :-

- Ceilings separating commercial from residential areas.
- Ceilings separating areas of high fire risk e.g. commercial kitchens, boiler rooms etc. from a protected route or from residential accommodation.
- Ceilings to basements if the accommodation is not provided with a full AFD system

There is no requirement to provide a fire resisting ceiling in bathrooms or WCs unless they contain a fire risk

1.2 Paragraph 2.0 - Provides information on forms of ceiling construction that provide 30 minute fire resistance.
Paragraph 3.0 - Provides information on forms of ceiling construction that provide 60 minute fire resistance.

Paragraphs 2.0 and 3.0 have been further divided as follows :-

- New Ceilings (2.1 & 3.1)
- Existing Ceilings (2.2 & 3.2) - Sets out methods of upgrading existing ceilings.
- Suspended Ceilings (2.3 & 3.3) - These are only generally acceptable if they are to a recognised system. Evidence must be obtained to show that they have been tested in accordance with BS 476 : Part 8 : 1972 or Part 22 : 1987. Care should be also be taken with suspended ceilings because of the need for maintenance of services and the danger of fire occurring in the void.

1.3 Particular attention must be given to protecting service ducts, pipework openings, cable trunkings, ceiling roses etc. which penetrate fire resisting ceilings. These must be properly enclosed and fire stopped. (Section 5 - Fire Stopping)

1.4 The examples given to provide ceilings of 30 and 60 minute construction are based on a standard timber floor in order that facings produced by different manufacturers can be compared. The timber joist size set out is likely to be the minimum size encountered. The construction used is as follows:-

Timber joists of minimum size 150mm x 50mm at max. 600mm centres with no infill and with plain edge floorboards.

Increasing the size of joists, providing some infill products such as Rockwool and/or the addition of a hardboard covering to the existing plain edged floor boarding can reduce thickness of the board required. If T & G floorboards are used hardboard overlay (where appropriate) would not be required.

1.5 Further information on fire resistance to timber floors can be obtained from BS 5268 : Part 4 : 1990 Clause 4.2 and from Manufacturers' Technical Services Departments

1.6 The following paragraphs 2.0 & 3.0 provide information supplied by four manufacturers whose products are listed below. If other manufacturers' products are to be used then they will have to be independently assessed. Note that this also applies if plasterboard is supplied by any manufacturer other than British Gypsum.

- *Gyproc Wallboard* is British Gypsum Ltd's trade name for standard plasterboard.
- *Gyproc Fireline Board* and *Glasroc Multi-Board* are manufactured by British Gypsum Ltd.
- *Supalux, Masterboard and MasterFill* are manufactured by Cape Boards Ltd
- *New Tacboard* and *New Tacfire* are manufactured by Promat Fire Protection Ltd.
- *Rockwool Rollbatts, RW2, RW3 and RW4 slabs* are manufactured by Rockwool Ltd.

2.0 THE FOLLOWING FORMS OF CONSTRUCTION WILL PROVIDE 30 MINUTES FIRE RESISTANCE :

2.1 New ceilings

The following boards when fixed to timber joists of minimum size 150mm x 50mm at max. 600mm centres with no infill and plain edge floorboards above will provide 30 minutes fire protection.

- 12.5mm *Gyproc Wallboard* fixed with 40mm galvanised nails to every timber support at 150mm centres. Timber support includes the joists and minimum 38mm x 38mm noggings to span between the joists to support the board edges. The joints to be taped and filled or surface scrimmed and skimmed. Existing plain edge floorboarding to be covered with 3.6mm hardboard. (Figure 1.1)

- 15mm *Gyproc Wallboard* fixed with 40mm galvanised nails to every timber support at 150mm centres. It is advisable though not a requirement (because of the thicker board used) that noggings, as set out in the above specification, are used. The joints to be taped and filled or surface scrimmed and skimmed. (Figure 1.1)

- 12.5mm *Fireline board* fixed with 40mm galvanised nails to every timber support at 150mm centres. Timber support includes the joists and minimum 38mm x 38mm noggings to span between the joists to support the board edges. The joints to be taped and filled or surface scrimmed and skimmed. (Figure 1.1)

- 12.5mm *Glasroc Multi-Board* fixed with 40mm galvanised nails to every timber support at 150mm centres. The joints to be taped and filled or surface scrimmed and skimmed. (Figure 1.1)

- 9mm *Supalux* fixed to joists with 50mm nails at 200mm centres. (6mm Masterboard can be used if joists 200mm deep) Existing plain edge floorboard to be overlaid with 4.8mm hardboard. (Figure 1.1)

- 9mm *New Tacfire* or *New Tacboard* fixed with 50mm nails at 200mm centres. (6mm *New Tacfire* or *New Tacboard* can be used if joists 200mm deep) Existing plain edge floorboard to be overlaid with 3mm hardboard. Joist centres to be max. 450mm for *New Tacboard.* (Figure 1.1)

- Expanded metal lathing to BS 1369 : Part 1 : 1987 securely fixed to the joists. Apply 13mm (from face of lath) lightweight *Gypsum metal lathing* type plaster (11mm *Carlite* bonding and 2mm *Carlite* finish).

3.6mm hardboard required for 12.5mm Gyproc Wallboard
No hardboard required for 15mm Gyproc Wallboard
No hardboard required for 12.5mm Fireline board

No hardboard required for 12.5mm Glasroc Multi-Board
4.8mm hardboard required for 9mm Supalux
3.0mm hardboard required for 9mm New Tacfire or New Tacboard

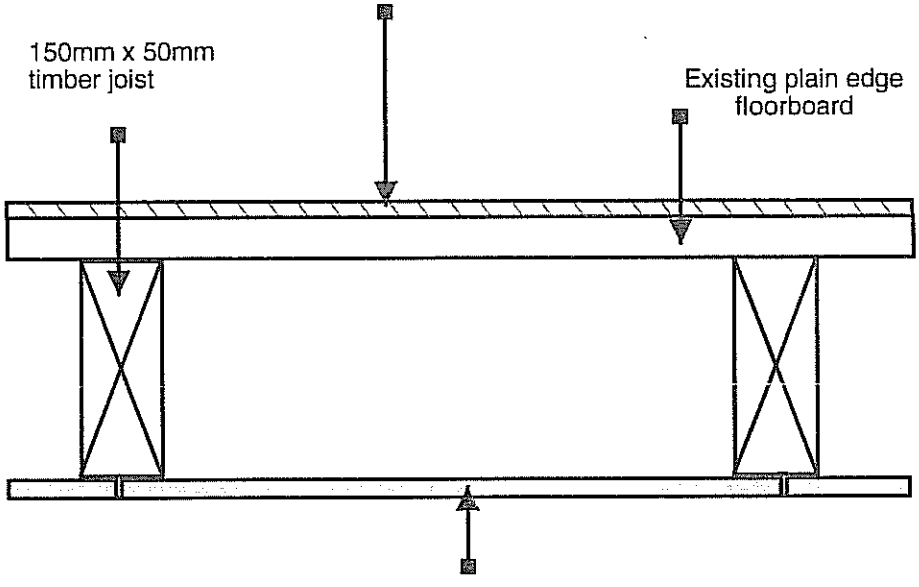


Figure 1.1 - Use of different manufactures' boards to provide a new ceiling of 30 minutes fire resistance

2.2 Existing ceilings

No specific tests have been carried out since 1920/1930 to determine the fire resistance of traditional lath and plaster ceilings. However L. P C. (One of the ***UKAS registered testing houses***) did carry out a test in 1983 to determine the fire resistance of a floor that had been provided with sound insulation between the joists and had been underdrawn with a traditional, purpose built, lath and plaster ceiling. The purpose of the test was to determine if the construction would provide a floor with 60 minutes fire resistance. It did pass the test satisfactorily. However, the observations made during the test indicate that if the sound insulation had not been provided, i.e. a test had been carried out solely on the lath and plaster ceiling, it would have failed at approximately 18 minutes and possibly earlier. Further, the BRE report, *Assessing Traditional Housing for Rehabilitation*, states that "recent research shows that lath and plaster will make a minimal contribution to fire resistance"

The following methods can be used to upgrade an existing (lath and plaster) ceiling made up of plain edge floorboards nailed to joists of minimum size 150mm x 50mm at 600mm centres with no infill to provide a ceiling with 30 minute fire resistance.

Ceilings can be upgraded in one of two ways :-

- By the provision of additional protection **below** the existing surface (i.e. room side). (2.2.1)
- By the provision of additional protection, **above** the existing ceiling, i.e. within the floor space. (2.2.2)

It is essential to ensure that if the existing ceiling is to be retained and upgraded, particularly if additional protection is to be provided within the floor space, that the gaps in the structure are properly sealed. (paragraph 2.2.3, figure 1.6). Refer to Section 5 - Fire Stopping for further details.

2.2.1 Protection below the existing ceiling

- The plain edge floorboards are to be overlaid with 3.2mm hardboard. The existing ceiling is to be supported by chicken wire or expanded metal lathing with 25mm mesh, securely nailed to the joists. 38mm x 38mm timber battens are then securely fixed to the joists, 38mm x 38mm noggings must also be fixed to span between the battens to support 12.5mm Gyproc Wallboard (Figure 1.2)

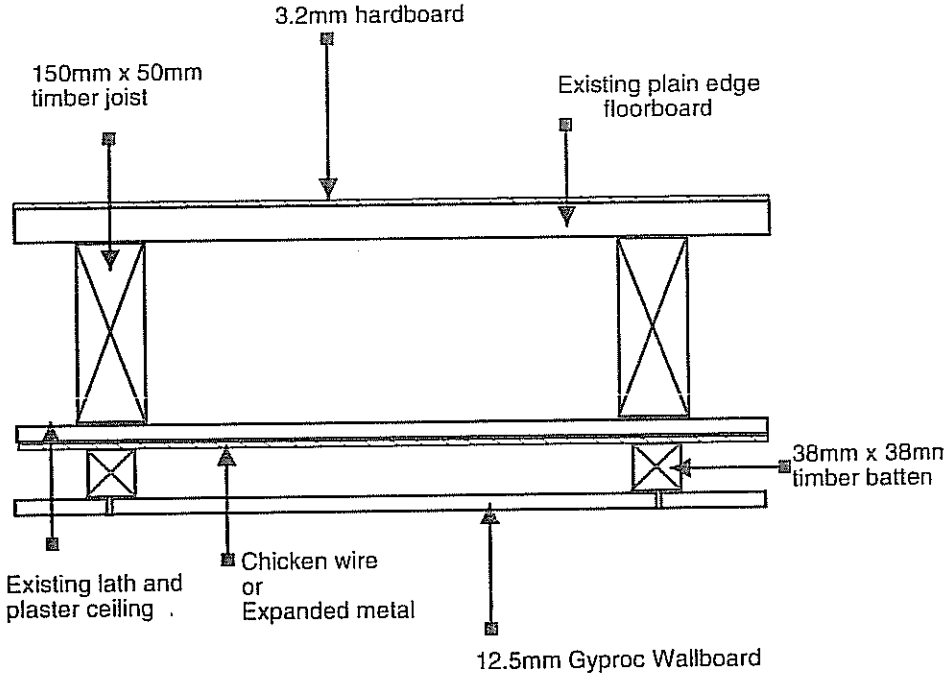


Figure 1.2 - Use of Gyproc Wallboard below an existing ceiling to provide 30 minutes fire resistance

- The existing ceiling is to be supported by chicken wire or expanded metal lathing securely nailed to the joists. 9mm *Supalux* is fixed with 63mm x No 8 screws at 300mm centres. No hardboard overlay is required. (Figure 1.3)

- 9mm *New Tacfire* is fixed with 63mm x No 8 screws at 300mm centres directly to the joists. (No chicken wire or expanded metal lathing required). No hardboard overlay required. (Figure 1.3). Alternatively 6mm New Tacfire or New Tacboard could be fixed provided it is applied to the ceiling underdrawn with chicken wire or expanded metal lathing and battens as illustrated in Figure 1.2.

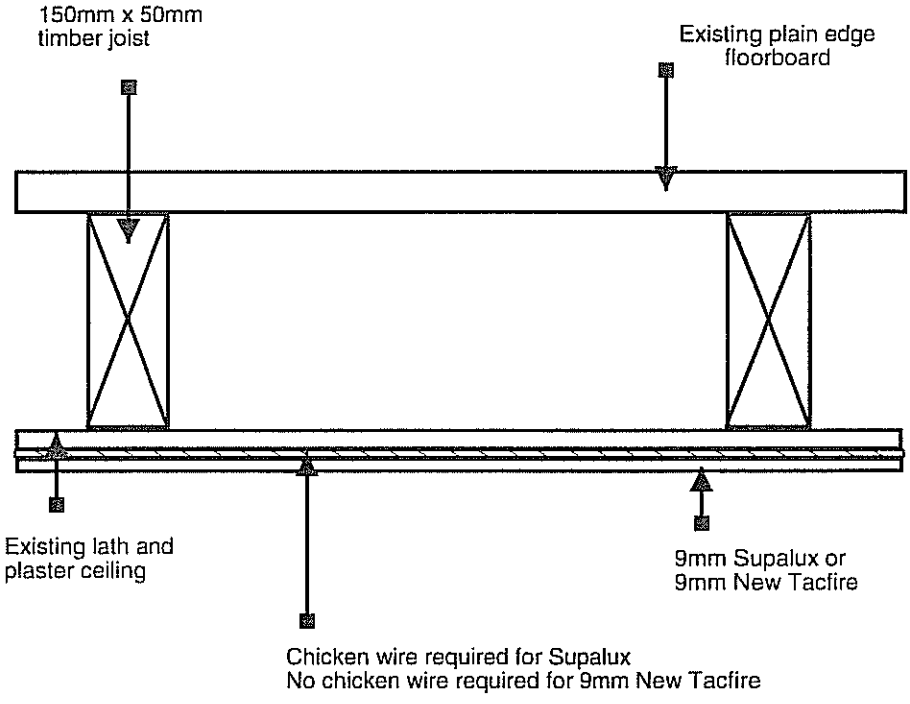


Figure 1.3 - Use of Supalux or New Tacfire below an existing ceiling to 30 minutes fire resistance

- The plain edge boards are to be overlaid with 3.2mm hardboard. The existing ceiling is to be underdrawn with expanded metal lathing to BS 1369: Part 1: 1987 securely nailed to the joists. Plaster with 13mm (from face of lath) lightweight *Gypsum metal lathing* type (11mm *Carlite* bonding and 2mm *Carlite* finish).

2.2.2 Protection above the existing ceiling

- Refer to 60 minute protection for *British Gypsum* board and plaster products. (paragraph 3.2.2)

- Take up, as necessary, existing floorboards. Fix 2 x 50mm x 9mm *Supalux* strips to each side of the joists with 50mm nails. Lay 9mm Supalux, cut to be a tight fit, between the joists on top of the strips. Relay floorboards. (Figure 1.4)

- Take up, as necessary, existing floorboards. Fix 1 x 50mm x 9mm New Tacfire strips to each side of the joists using 50mm nails or 38mm x No 8 screws at 300mm centres. Lay 9mm *New Tacfire* on top of the strips between the joists. Relay the floorboards. (Figure 1.4)

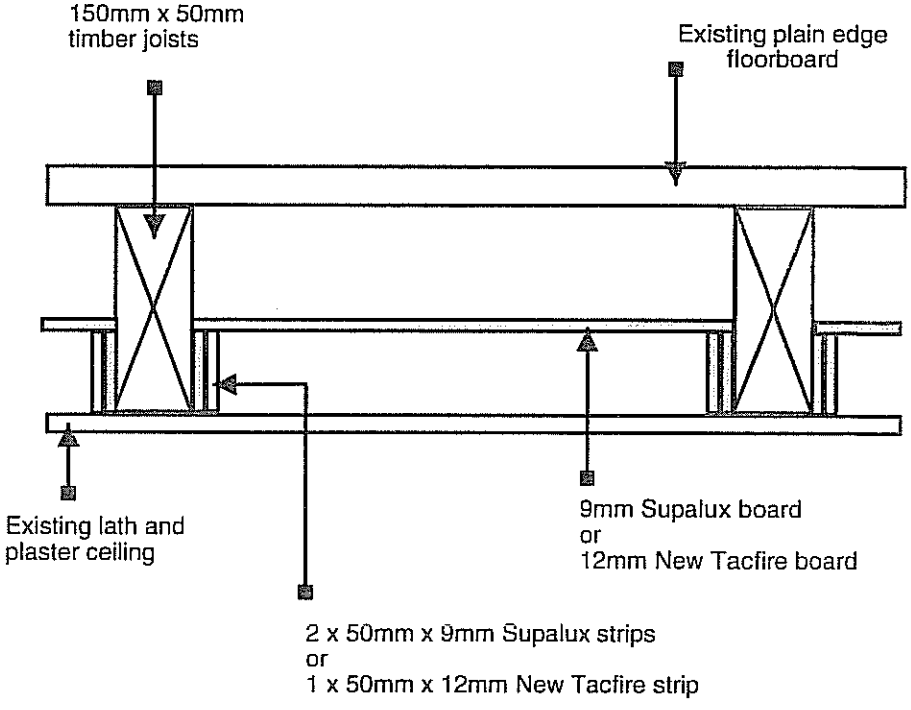


Figure 1.4 - Use of Supalux or New Tacfire above an existing ceiling to provide 30 minutes fire resistance

- Take up, as necessary, existing floorboards. Lay 25mm wire mesh over the joists, which must have a maximum span of 400mm centres, and between them to form a tray. Fit 100mm thick *Rockwool RW2* mineral fibre slab of density 33 Kg/m³ into the tray. Relay the floorboards and cover with 3.2mm hardboard. (Figure 1.5)

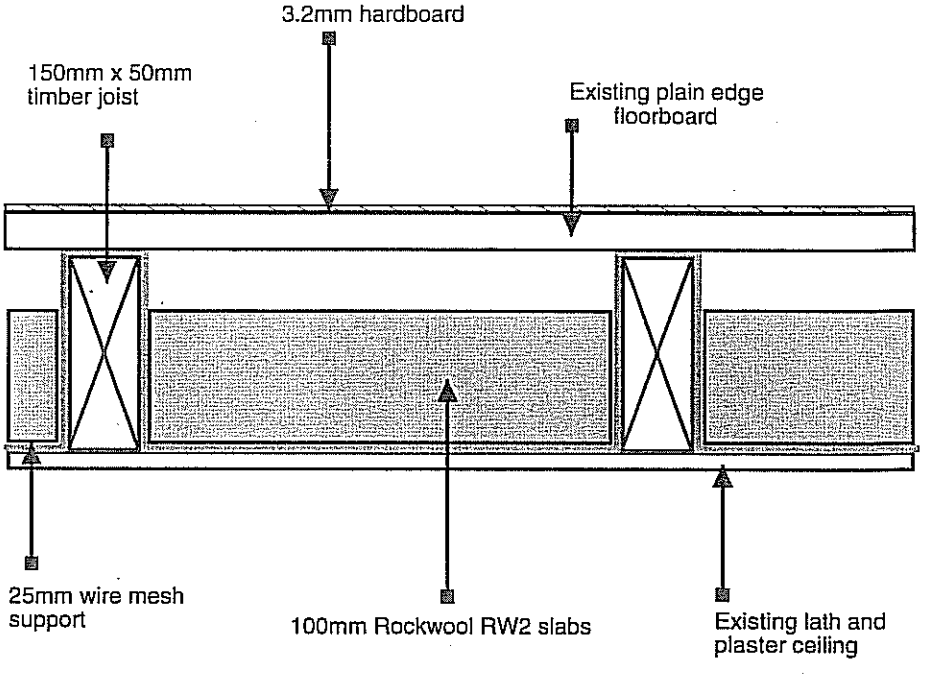


Figure 1.5 - Use of Rockwool Slabs above an existing ceiling to provide 30 minutes fire resistance

2.2.3 Great care needs to be taken at the junctions between floors and walls particularly where the floor construction is to be upgraded by the provision of additional protection within the floor space. The gap should be sealed between the adjacent joist and partition wall and the gap between the floorboards and skirting boards with intumescent paste (Figure 1.6)

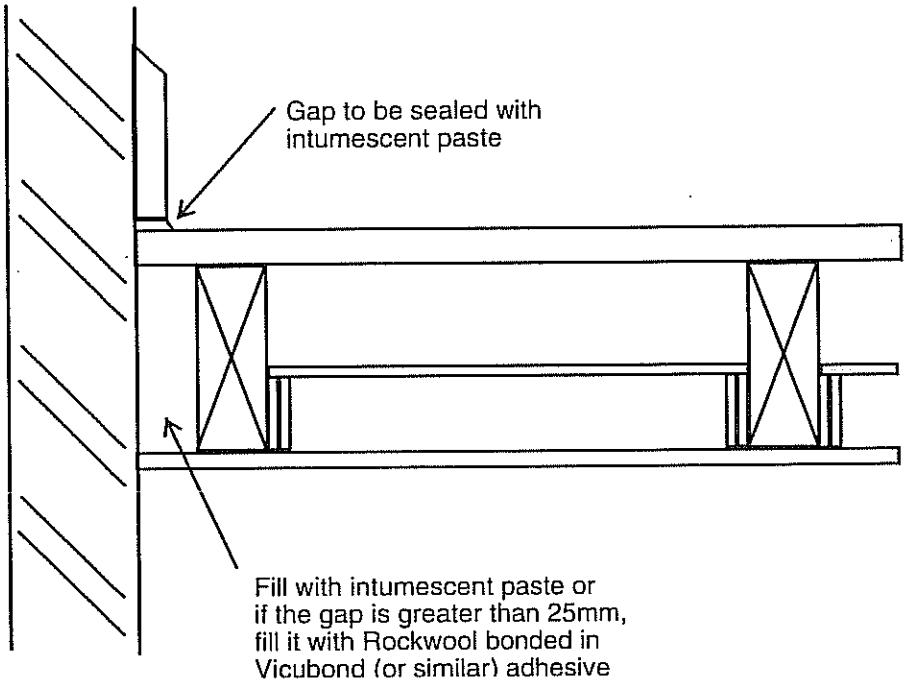


Figure 1.6 - Use of fire resistant products to seal gaps in the structure

2.3 Suspended ceilings

The following methods can be used to provide a suspended ceiling made up of plain edge floorboards nailed to joists of minimum size 150mm x 50mm at 600mm centres with no infill to provide a ceiling with 30 minute fire resistance.

- The *Gyproc M/F suspended ceiling system* which is constructed of:-
  MF6A perimeter channels are fixed to the walls at the desired height with suitable fastenings at 600mm centres. Gyproc strap hangers (MF8) are screw fixed directly to the top third of the joist at 1200mm centres (to form a 1200mm x 1200mm grid). The primary grid using support channels (MF7) is then fixed to the hangers at max.1200mm centres for single boarding and 900mm centres for double boarding. The secondary grid using MF5 channel sections is then fixed to the underside of the primary grid at 450mm centres using MF9 connecting clips. No hardboard covering is required to be laid over the existing plain edge floorboards.
  The following boards are then screwed to the channels forming the secondary grid to provide 30 minute fire resistance:

  2 layers of 12.5mm *Gyproc Wallboard* with joints staggered are fixed using 36mm Gyproc drywall screws at 230mm centres. (Figures 1.7 & 1.8)
  OR
  1 layer of 12.5mm *Fireline* board is fixed using 25mm Gyproc drywall screws at 230mm centres. (Figures 1.7 & 1.8 but with single board protection)

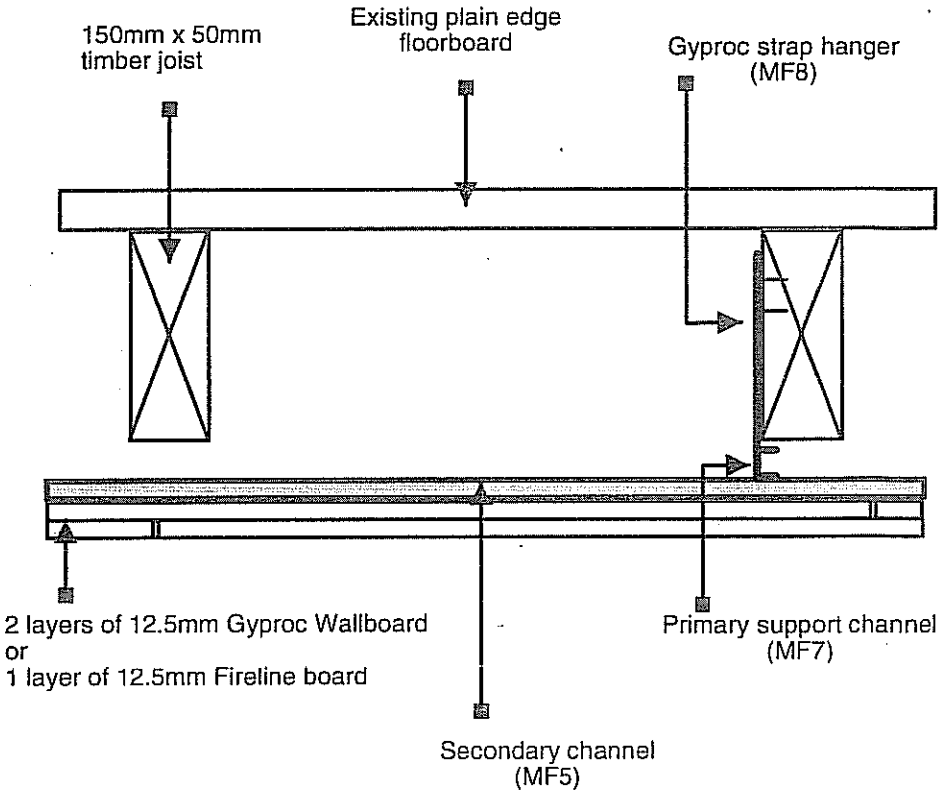


Figure 1.7 - Use of Gyproc Wallboard or Fireline board to provide a suspended ceiling of 30 minutes fire resistance

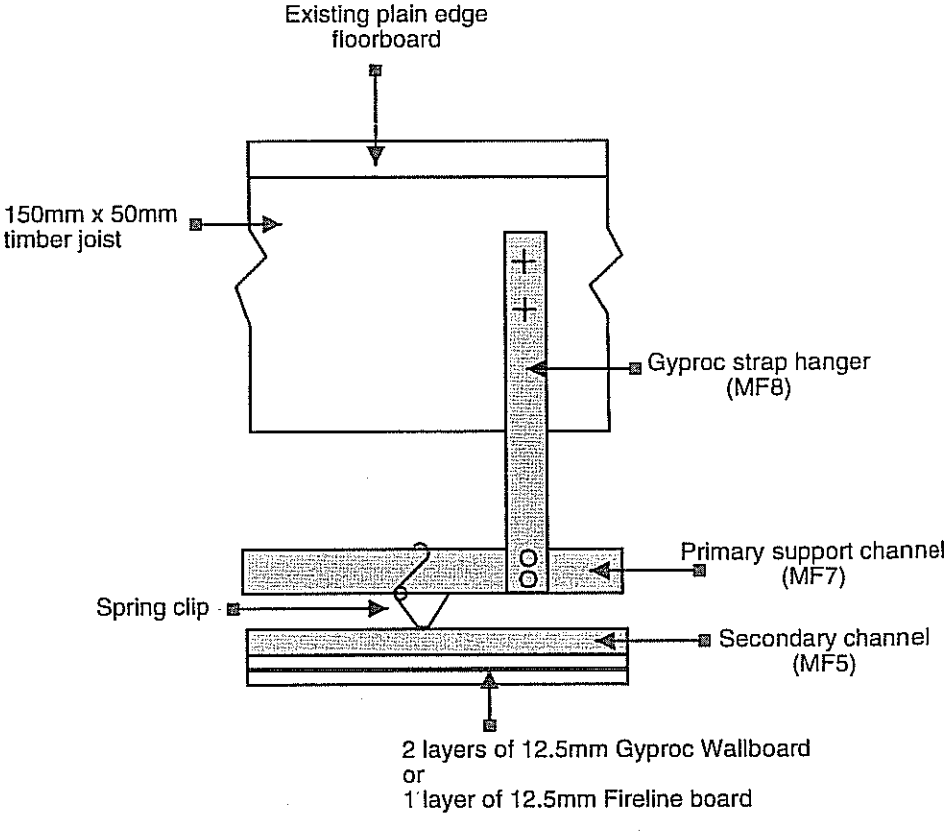


Figure 1.8 - Use of Gyproc Wallboard or Fireline board to provide a suspended ceiling of 30 minutes fire resistance

- An alternative to the *Gyproc M/F system* is the *Gyproc Gyplyner system.* It is simpler to erect but it's application is limited by the maximum distance between the bottom of the joist and underside of the board (approximately 150mm). Full details of this system can be obtained from British Gypsum.

- 6mm *New Tacfire* panels 595mm x 595mm or 1195mm x 595mm are held with spring clips to a Donn fire rated exposed grid ceiling system suspended from wires or angles. The ceiling must be suspended at least 200mm below the base of the joists. The existing plain edge floorboards are to be overlaid with 3.6mm hardboard. (Figures 1.9 & 1.10)

- 6mm *MasterFill* panels 600mm x 600mm or 1200mm x 600mm are held with spring clips to a fire rated exposed tee system, on wire hangers fixed with 30mm long nails a minimum 75mm above the base of the joists. The ceiling must be suspended at least 200mm below the base of the joists. The existing plain edge floorboards are to be overlaid with 4.8mm hardboard (Figures 1.9 & 1.10)

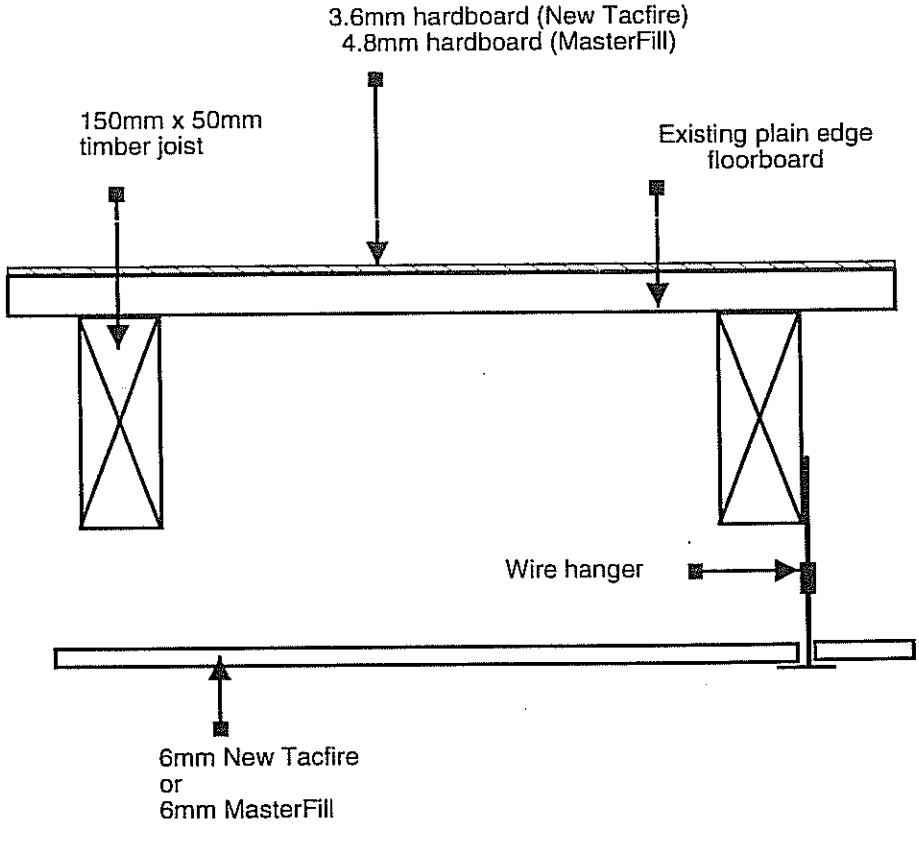


Figure 1.9 - Use of New Tacfire or MasterFill to provide a suspended ceiling of 30 minutes fire resistance

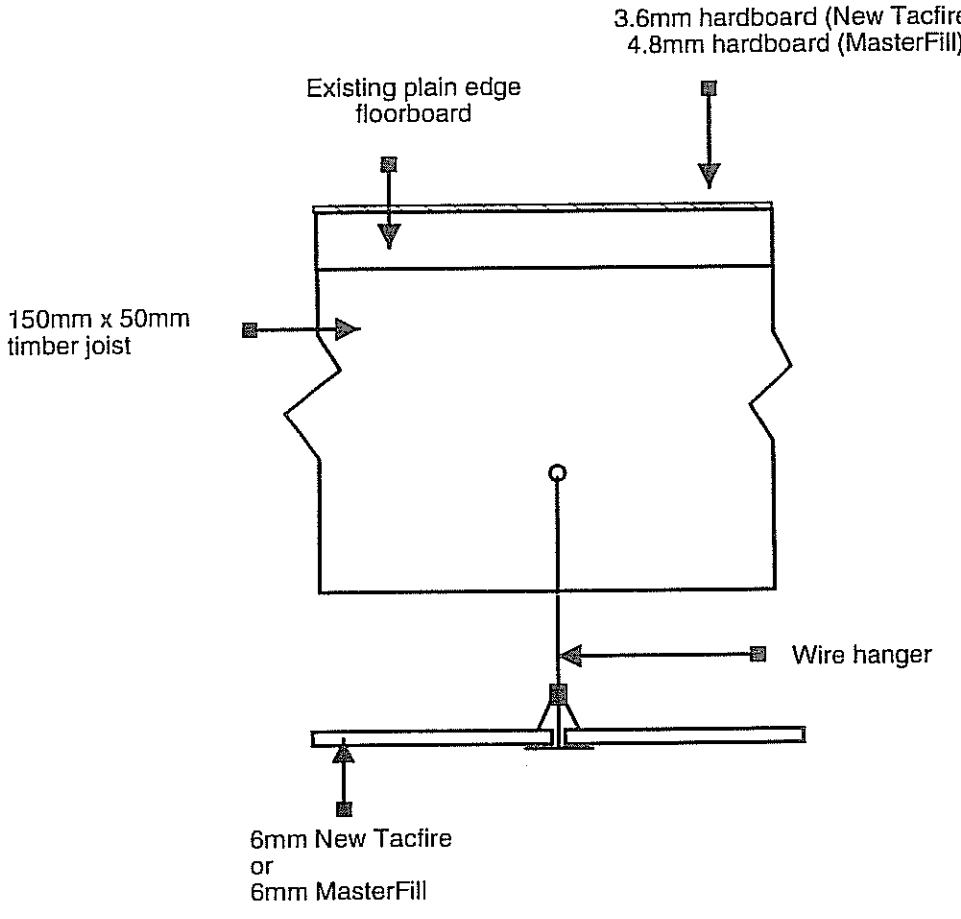


Figure 1.10 - Use of New Tacfire or MasterFill to provide a suspended ceiling of 30 minutes fire resistance

3.0 THE FOLLOWING FORMS OF CONSTRUCTION WILL PROVIDE 60 MINUTES FIRE RESISTANCE

3.1 New ceilings

The following boards when fixed to timber joists of minimum size 150mm x 50mm at max. 600mm centres with no infill and plain edged floorboard will provide 60 minutes fire protection.

- 2 x 15mm (or 12.5mm + 19mm) *Gyproc Wallboard* fixed with 50mm (1st layer) and 65mm (2nd layer) galvanised nails to every timber support at 150mm centres. Timber support includes the joists and minimum 38mm x 38mm noggings to span between the joists to support the board edges. The joints to be staggered, then taped and filled or surface scrimmed and skimmed. The plain edge floorboards are to be overlaid with 3.2mm hardboard. (Figure 1.11)

- 2 x 12.5mm *Fireline* board fixed with 40 mm (1st layer) and 50mm (2nd layer) galvanised nails to every timber support at 150mm centres. Timber support includes the joists and minimum 38mm x 38mm noggings to span between the joists to support the board edges. The joints to be staggered, then taped and filled or surface scrimmed and skimmed. (Figure 1.11)

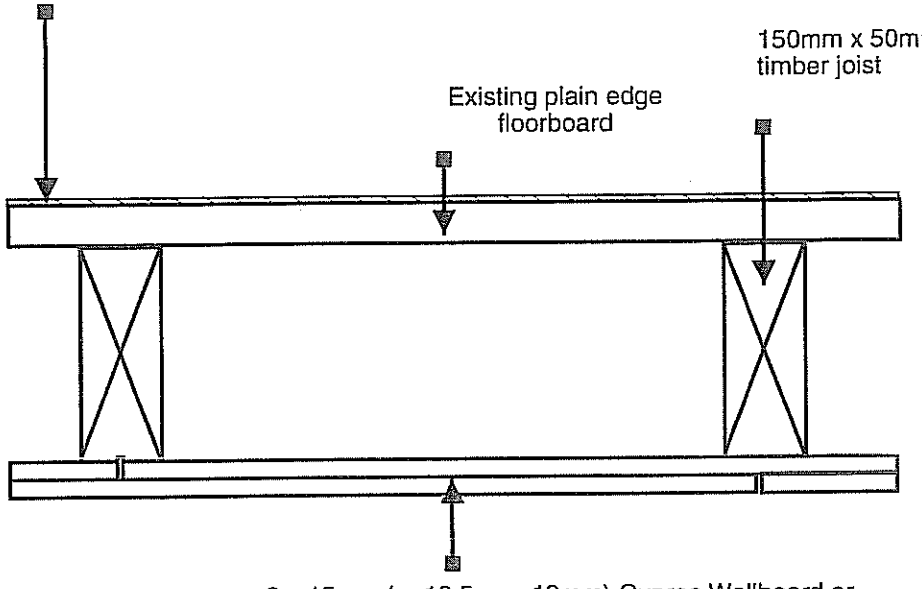
- 2 x 10mm *Glasroc Multi-Board* fixed with 50mm galvanised nails to every timber support at 150mm centres. Timber support includes the joists and minimum 38mm x 38mm noggings to span between the joists to support the board edges. The joints to be staggered, then taped and filled or surface scrimmed and skimmed. (Figure 1.11)

- 2 x 12mm *Supalux*, joints staggered, fixed with 63mm x No 8 screws at 300mm centres. Existing plain edge floorboard to be overlaid with 4.8mm hardboard. (Figure 1.11).

- 2 x 12mm *New Tacfire*, joints staggered, 1st layer using 50mm nails/screws at 450mm centres, 2nd layer using 75mm x No 8 screws at 300mm centres. Existing plain edge floorboards to be overlaid with 3.0mm hardboard. (Figure 1.11)

3.2mm hardboard required for Gyproc Wallboard
No hardboard required for Fireline board
No hardboard required for Glasroc Multi-Board

4.8mm hardboard required for Supalux
3.0mm hardboard required for New Tacfire



2 x 15mm (or 12.5mm+19mm) Gyproc Wallboard or
2 x 12.5mm Fireline board or
2 x 10mm Glasroc Multi-Board or

2 x 12mm Supalux or
2 x 12mm New Tacfire
Joints to be staggered in all cases.

Figure 1.11 - Use of different manufacturers' boards to provide a new ceiling of 60 minutes fire resistance

3.2 Existing ceilings

No specific tests have been carried out to determine the fire resistance of traditional lath and plaster ceilings. However L. P C. (One of the UKAS accredited laboratories) did carry out a test in 1983 to determine the fire resistance of a floor that had been provided with sound insulation between the joists and had been underdrawn with a traditional, purpose built, lath and plaster ceiling. The purpose of the test was to determine if the construction would provide a floor with 60 minutes fire resistance. It did pass the test satisfactorily. However, the observations made during the test indicate that if the sound insulation had not been provided i.e. a test had been carried out solely on the lath and plaster ceiling it would have failed at 18 minutes and possibly earlier. Further, the BRE report, *Assessing Traditional Housing For Rehabilitation* states that "recent research shows that lath and plaster will make a minimal contribution to fire resistance"

The following methods can be used to upgrade an existing (lath and plaster) ceiling made up of plain edge floorboards nailed to joists of minimum size 150mm x 50mm at 600mm centres with no infill to provide a ceiling with 60 minute fire resistance.

Ceilings can be upgraded in one of two ways :-

- By the provision of additional protection **below** the existing surface (i.e. room side). (3.2.1)
- By the provision of additional protection **above** the existing ceiling i.e. within the floor space. (3.2.2)

It is essential to ensure that if the existing ceiling is to be retained and upgraded, particularly if additional protection is to be provided within the floor space, that the gaps in the structure are properly sealed. (paragraph 3.2.3, figure 1.19). Refer to Section 5 - Fire Stopping for further details.

3.2.1 Protection below the existing ceiling

- The plain edge boards are to be overlaid with 3.2mm hardboard. The existing ceiling is to be supported by chicken wire or expanded metal lathing of 25mm mesh, securely nailed to the joists. 38mm x 38mm timber battens are then securely fixed to the joists, 38mm x 38mm noggings must also be fixed to span between the battens to support the following board edges :-

  Two layers of 12.5mm *Gyproc Fireline* board with joints staggered. (Figure 1.12)
  OR
  Two layers of 10mm *Glasroc Multi-Board* with joints staggered. (Figure 1.12)

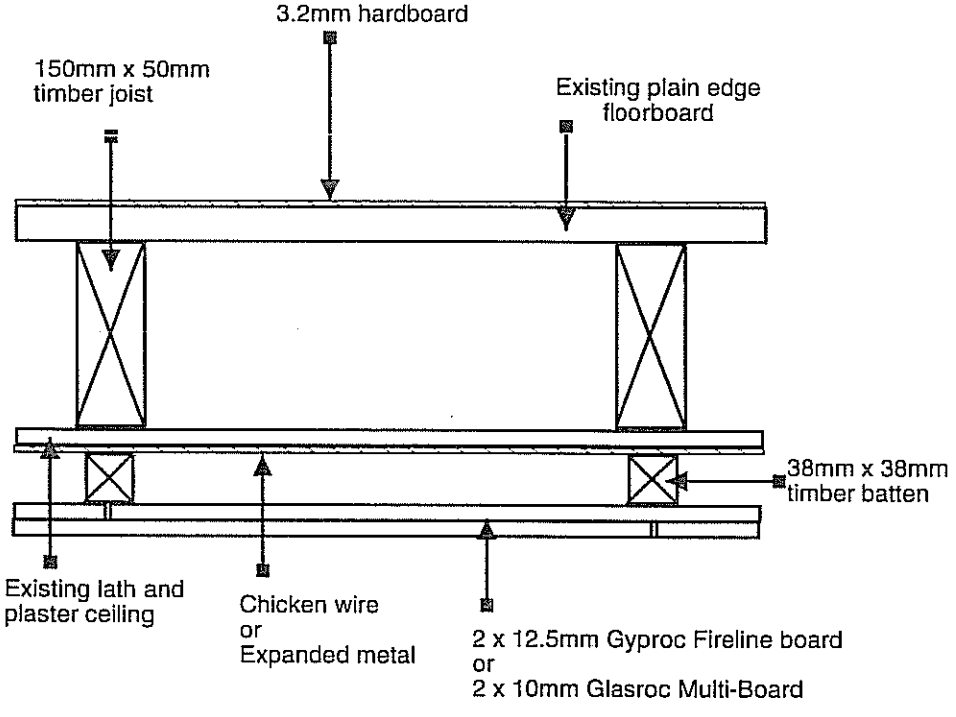


Figure 1.12 - Use of Fireline board or Glasroc Multi-Board below an existing ceiling to provide 60 minutes fire resistance

- The plain edge floorboards are to be overlaid with 4.8mm hardboard. The existing ceiling is supported with chicken wire or expanded metal securely fixed to the joists. 12mm *Supalux* is fixed through the existing ceiling to the joists with 63mm x No 8 woodscrews at 300mm centres (Figure 1.13)

- The plain edge boards are to be overlaid with 4.8mm hardboard. No chicken wire required unless ceiling very uneven in which case chicken wire and timber battens to be fixed as shown in figure 1.12. 12mm *New Tacfire* is fixed through the existing ceiling to the joists with 63mm x No 8 screws.

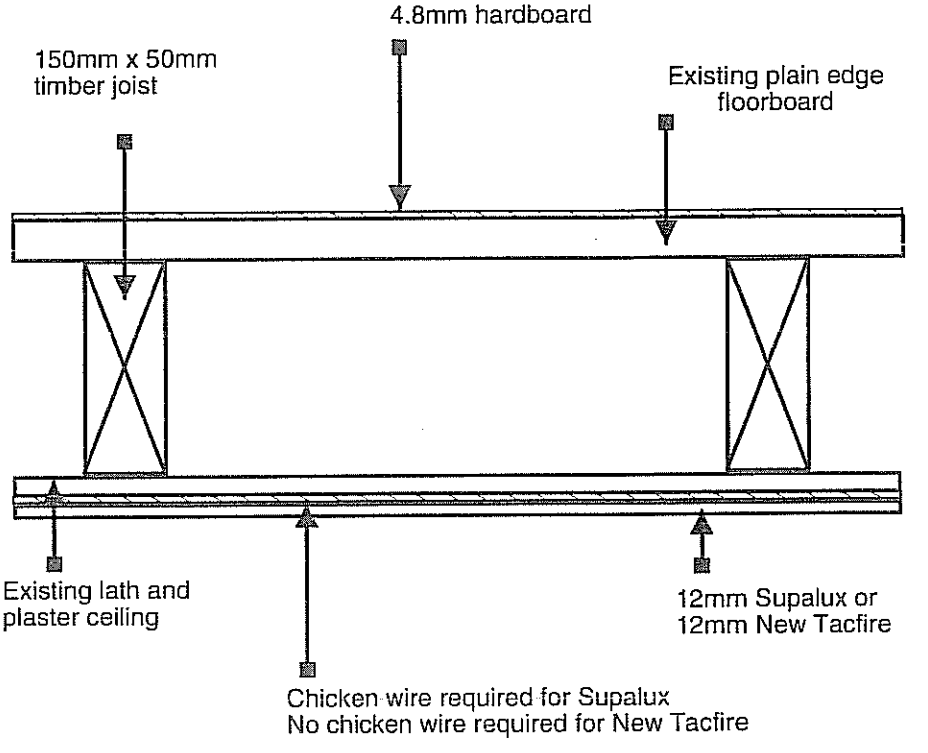


Figure 1.13 - Use of Supalux or New Tacfire below an existing ceiling to provide 60 minutes fire resistance

- The plain edge boards are to be overlaid with 3.2mm hardboard. The existing ceiling is to be underdrawn with expanded metal lathing to BS 1369 : Part 1 : 1987 securely nailed to the joists. Plaster with 13mm (from face of lath) lightweight *Gypsum metal lathing* type (11mm *Carlite* bonding and 2mm *Carlite* finish).

3.2.2 Protection above the existing ceiling

- Take up, as necessary, the existing floorboards. Fix 100mm x 12.5mm thick strips of *Glasroc Multi-Board* to each side of the joists using 36mm *Gyproc Drywall* screws at 300mm centres. Lay 12.5mm *Glasroc Multi-Board* on top of the strips. Relay the floorboards. Overlay the floorboards with 3.0mm hardboard (Figure 1.14)

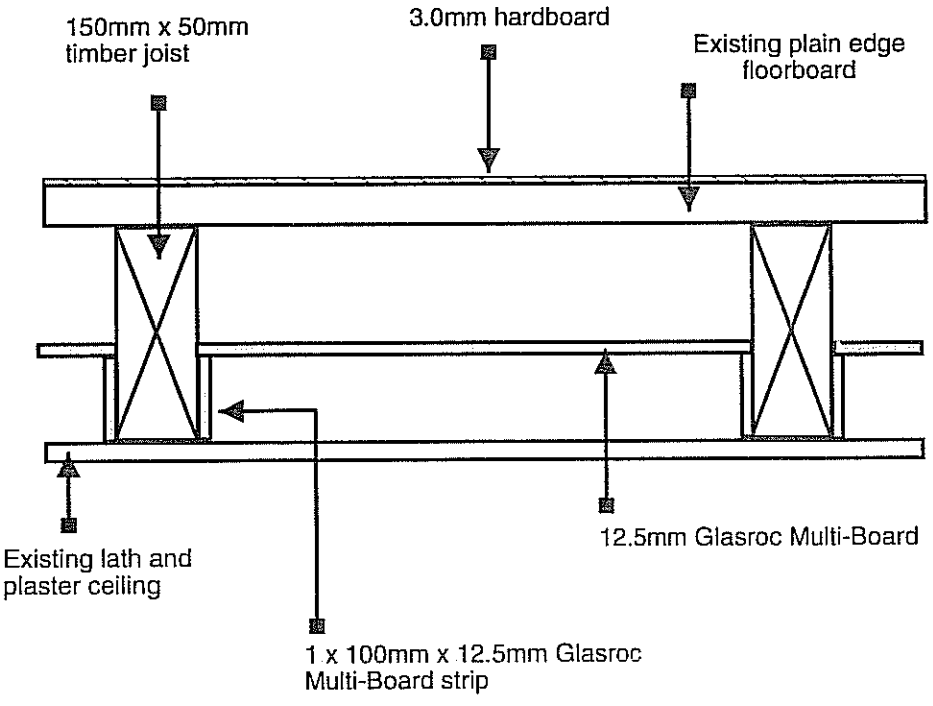


Figure 1.14 - Use of Glasroc Multi-Board above an existing ceiling to provide 60 minutes fire resistance

- Take up, as necessary, the existing floorboards. Lay 19mm *Carlite metal lathing plaster* trowelled between the joists in conjunction with expanded metal lathing or chicken wire at mid thickness of the plaster and well turned up and fixed to the joist sides or continuous over the joists. To prevent staining polythene sheets should be laid on the back of the existing ceiling. Lay 3.2mm hardboard over the joists. (Figure 1.15)

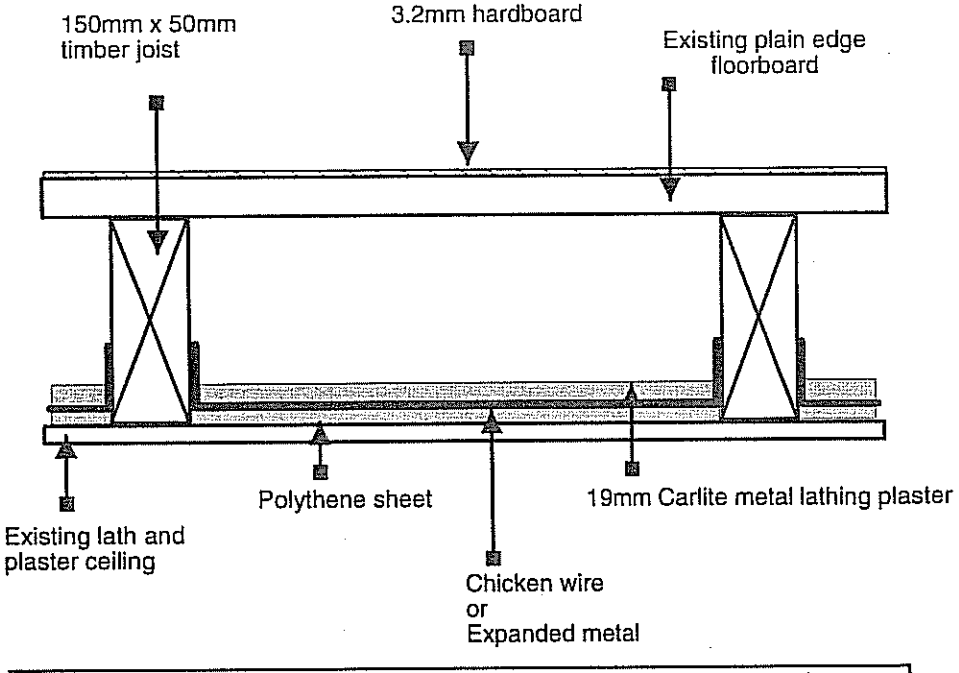


Figure 1.15 - Use of plaster above an existing ceiling to provide 60 minutes fire resistance

- Take up, as necessary, the existing floorboards. Fix 2 x 75mm x 12mm Supalux strips to each side of the joists with 50mm x No 8 screws. Lay 12mm *Supalux* cut, to be a tight fit, between the joists on top of the strips. *Superlux* to be overlaid with 80mm x 23Kg/m3 *Rockwool Rollbatts*. Relay the floorboards. Overlay the floorboards with 4.8mm hardboard (Figure 1.16)

- Take up, as necessary, the existing floorboards. Fix 1 x 75mm x 92mm *New Tacfire* strips fixed to each side of the joists using 75mm nails at 200mm centres or 63mm x No 8 screws at 300mm centres. Lay 2mm *New Tacfire* on top of the strips between the joists.
  New Tacfire to be overlaid using 80mm x 23 Kg/m^3. *Rockwool Rollbatts*
  Relay the floorboards (Figure 1.16)

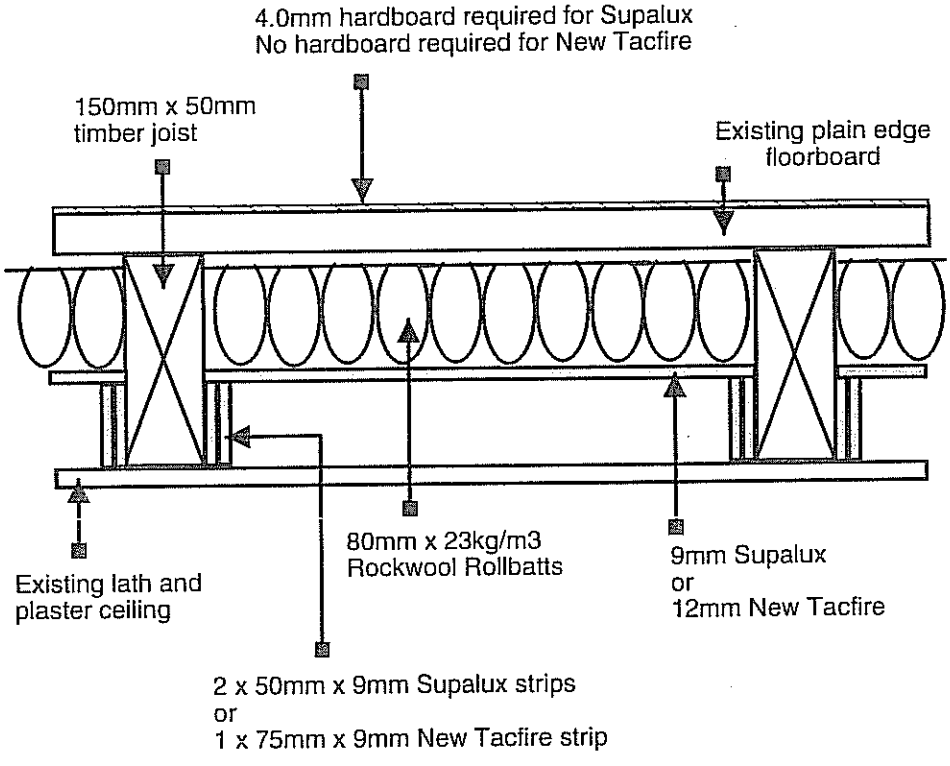


Figure 1.16 - Use of Rockwool and Supalux or New Tacfire above an existing ceiling to provide 60 minutes fire resistance

- Take up, as necessary, the existing floorboards. Fix 1 x 75mm x 12mm *New Tacfire* strips fixed to each side of the joists using 75mm nails at 200mm centres or 63mm x No 8 screws at 300mm centres. Lay 2 x 12mm *New Tacfire* on top of the strips between the joists. Relay the floorboards (Figure 1.17)

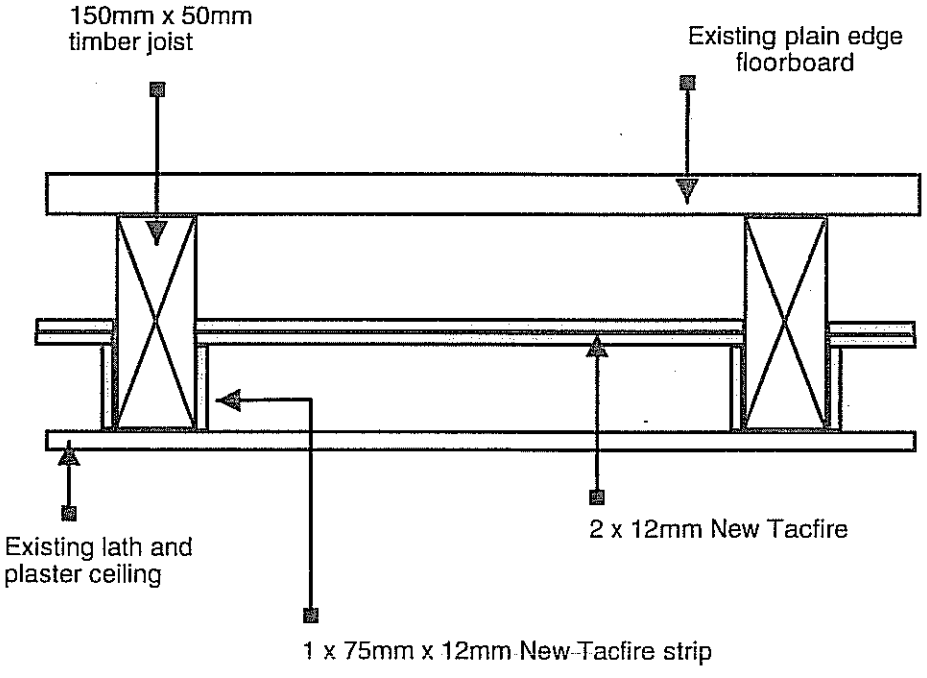


Figure 1.17 - Use of New Tacfire above an existing ceiling to provide 60 minutes fire resistance

- The joists for this specification must be a minimum 200mm x 44mm at 400mm centres. Take up, as necessary, existing floorboards. Lay 25mm wire mesh, over the joists and between them, to form a tray. Fit 100mm thick *Rockwool RW2* mineral fibre slab of density 33 Kg/m³ into the tray. Relay the floorboards and cover with 3.2mm hardboard. (Figure 1.18)

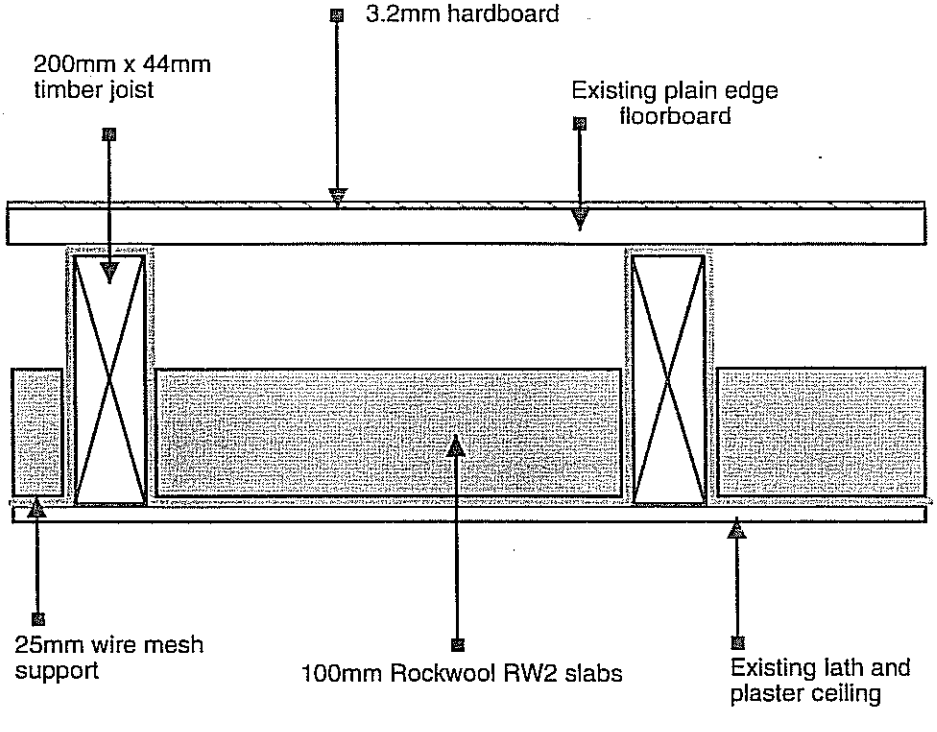


Figure 1.18 - Use of Rockwool Slabs above an existing ceiling to provide 60 minutes fire resistance

3.2.3 Great care needs to be taken at the junctions between floors and walls Particularly where the floor construction is to be upgraded by providing additional protection within the floor space. The gap should be sealed between the adjacent joist and partition wall and the gap between the floorboards and skirting boards with intumescent paste (Figure 1.19)

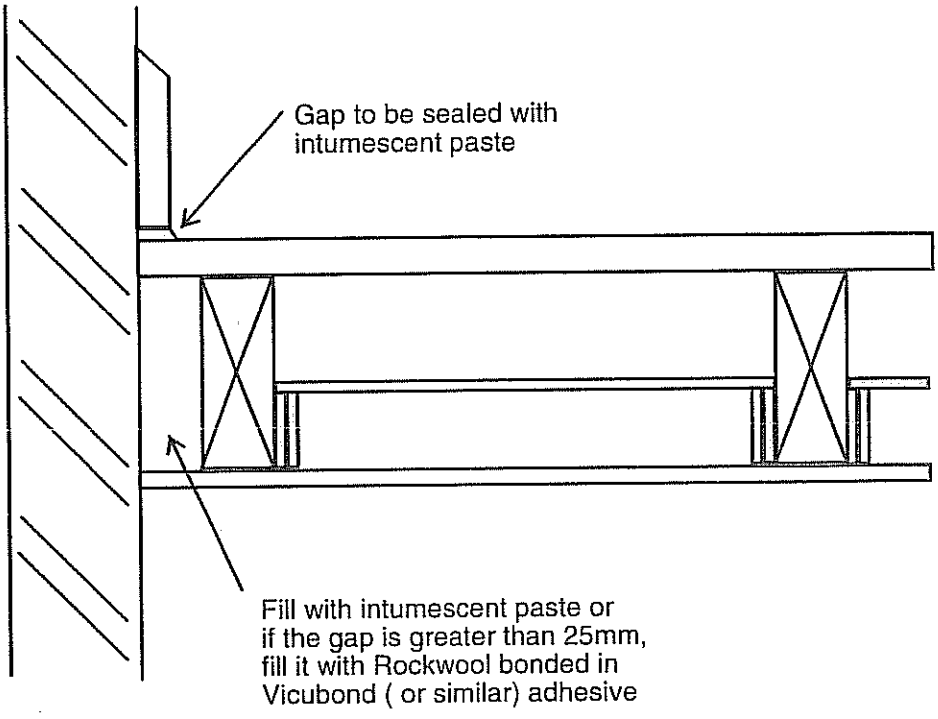


Figure 1.19 - Use of fire resistant products to seal gaps in the structure

3.3 Suspended ceilings

The following methods can be used to provide a suspended ceiling made up of plain edge floorboards nailed to joists of minimum size 150mm x 50mm at 600mm centres with no infill to provide a ceiling with 60 minute fire resistance.

- The *Gyproc M/F suspended ceiling system* which is constructed of:-

  MF6A perimeter channels are fixed to the walls with suitable fastenings at 600mm centres. Gyproc strap hangers (MF8) are screw fixed directly to the top third of the joist at 1200mm centres (to form a 1200mm x 1200mm grid). The primary grid using support channels (MF7) is then fixed to the hangers at max. 1200mm centres single boarding and 900mm centres double boarding. The secondary grid using MF5 channel sections are then fixed to the underside of the primary grid at 450mm centres (400mm centres *Glasroc Multi-Board*) using MF9 connecting clips.

The following boards are then screwed to the channels forming the secondary grid to provide 60 minute fire resistance:

2 layers of 12.5mm *Fireline* board with joints staggered is fixed using 36mm Gyproc drywall screws at 230mm centres. The existing plain edge floorboards are to be overlaid with 3.6mm hardboard (Figures 1.20 & 1.21).
OR
1 layer of 12.5mm *Glasroc Multi-Board* is fixed using 25mm Gyproc drywall screws at 230mm centres. The Secondary grid (MF5) is fixed at maximum 400mm centres. The existing plain edge floorboards are to be overlaid with 3.6mm hardboard (Figures 1.20 & 1.21, 1 layer of board only)

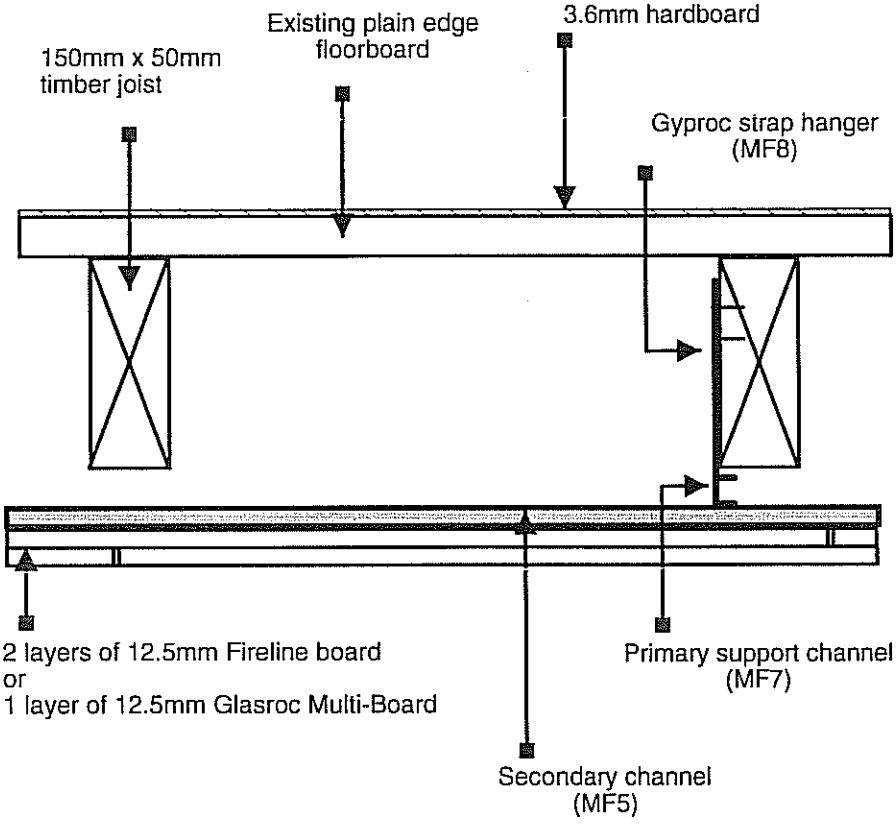


Figure 1.20 - Use of Fireline board or Glasroc Multi-Board to provide a suspended ceiling of 60 minutes fire resistance

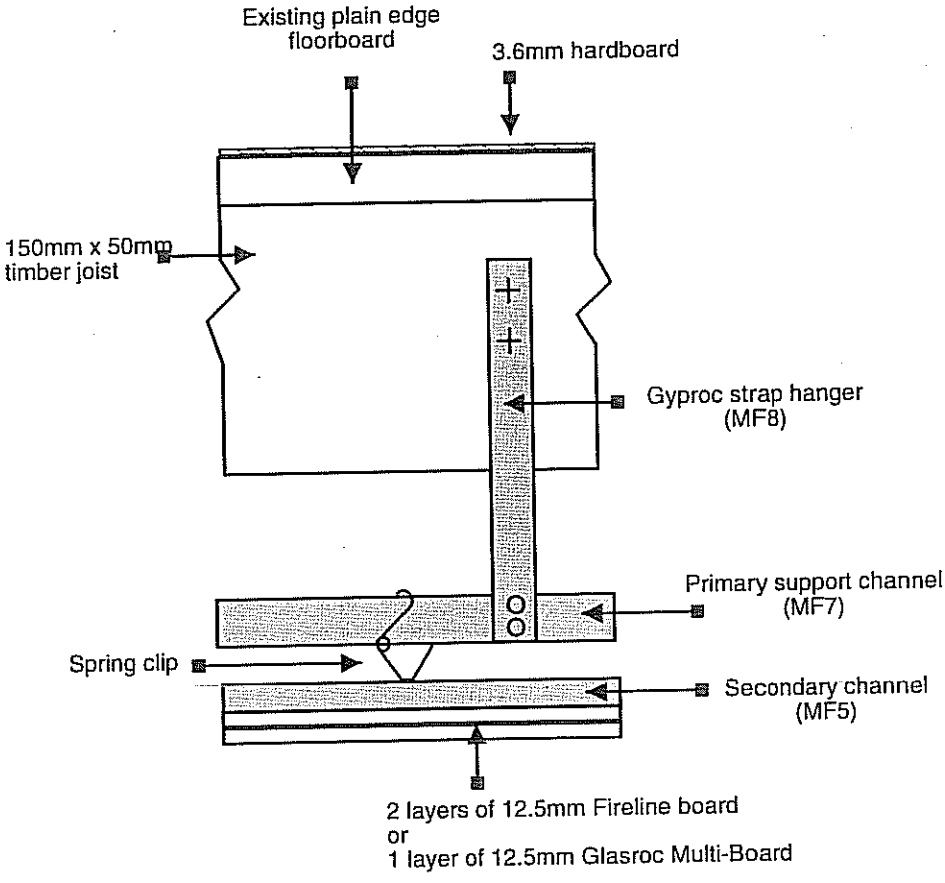


Figure 1.21 - Use of Fireline board or Glasroc Multi-Board to provide a suspended ceiling of 60 minutes fire resistance

- An alternative to the *Gyproc M/F system* is the *Gyproc Gyplyner system.* It is simpler to erect but it's application is limited by the maximum distance between the bottom of the joist and underside of the board (approximately 150mm). Full details of this system can be obtained from British Gypsum.

- 6mm *New Tacfire* panels 595mm x 595mm or 1195mm x 595mm are held with spring clips to a Donn fire rated exposed grid ceiling system suspended from wires or angles. 30mm Rockwool RW3 is placed above the panels. The existing plain edge floorboards are to be overlaid with 3.6mm hardboard. (Figures 1.22 & 1.23)

- 6mm *Supalux* panels 600mm x 600mm or 1200mm x 600mm are held with spring clips to a fire rated exposed tee system, on wire hangers fixed with 30mm long nails a minimum 75mm above the base of the joists 30mm *Rockwool RW4* is placed above the panels. The plain edge floorboards are to be overlaid with 4.8mm hardboard. (Figures 1.22 & 1.23)

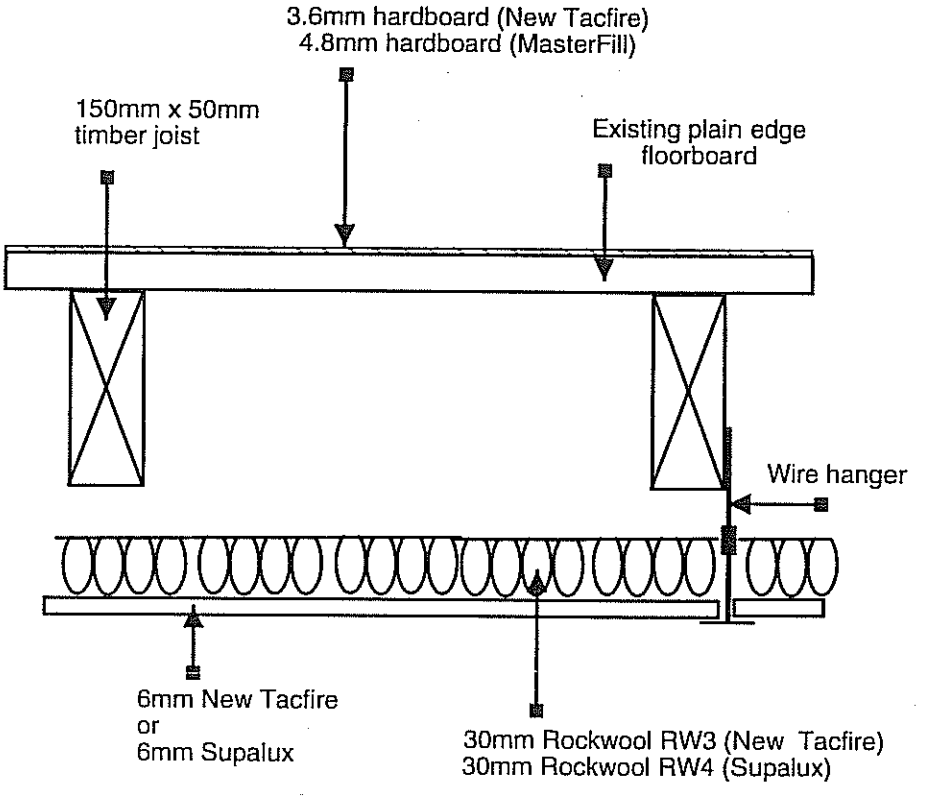


Figure 1.22 - Use of Rockwool and New Tacfire or Supalux to provide a suspended ceiling of 60 minutes fire resistance

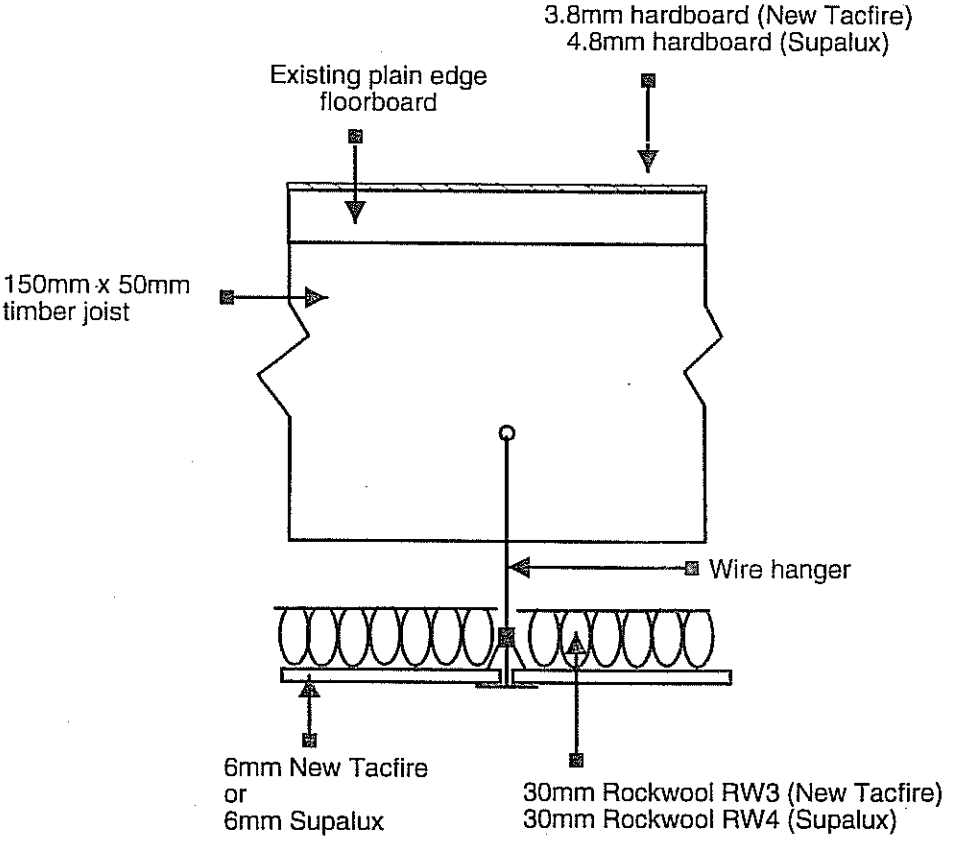


Figure 1.23 - Use of Rockwool and New Tacfire or Supalux to provide a suspended ceiling of 60 minutes fire resistance

This section is produced in association with
Rockwool, British Gypsum and Promat Fire Protection

WALLS AND PARTITIONS

1.0 INTRODUCTION

1.1 The current ***HMO Code of Practice*** gives details about the level of fire resistance required in every circumstance and reference must be made to that document. However, in practice fire resistance, when tested to BS 476 : Part 8 : 1972 or Parts 20 - 22 : 1987, will be restricted to 30 minutes and 60 minutes in most HMOs.

In general, 30 minute fire resisting construction will be required in the following circumstances :-

- Walls enclosing a protected route except where 60 minutes protection is required (see below).
- Walls between residential accommodation

In general, 60 minute fire resisting construction will be required in the following circumstances :-

- Walls separating commercial from residential areas.
- Walls separating areas of higher fire risk e.g. commercial kitchens, boiler rooms etc. from a protected route or from residential accommodation.
- Separating walls i.e. Those between buildings.

There is no requirement to provide fire resisting walls to Bathrooms or WCs unless they contain a fire risk.

1.2 Paragraph 2.0 - provides information on forms of wall construction that provide 30 minute fire resistance.

Paragraph 3.0 - provides information on forms of wall construction that provide 60 minute fire resistance.

Paragraphs 2.0 and 3.0 have been further divided as follows :-

- New Partitions (2.1 & 3.1)
- Existing Partitions - Sets out methods of upgrading existing structures (2.2 & 3.2)

1.3 Ensure that partitions fully extend flush to floors and ceilings without gaps and that voids and wall cavities do not prejudice the fire separation.

Particular attention must be given to protecting service ducts, pipework openings, cable trunkings etc. which penetrate fire resisting walls. These must be properly enclosed and fire stopped. The advice of the fire officer should be sought if cavity barriers or fire dampers are considered necessary.
(Section 5 - Fire Stopping)

1.4 In the case of stud partitions the following form of construction has been assumed in order that the facings produced by different manufacturers can be compared:-

A partition which is either loadbearing or non loadbearing and is constructed of timber studs of minimum size 75mm x 50mm at max. 600mm centres with no infill and with the following facings *on both sides* (Figure 2.1)

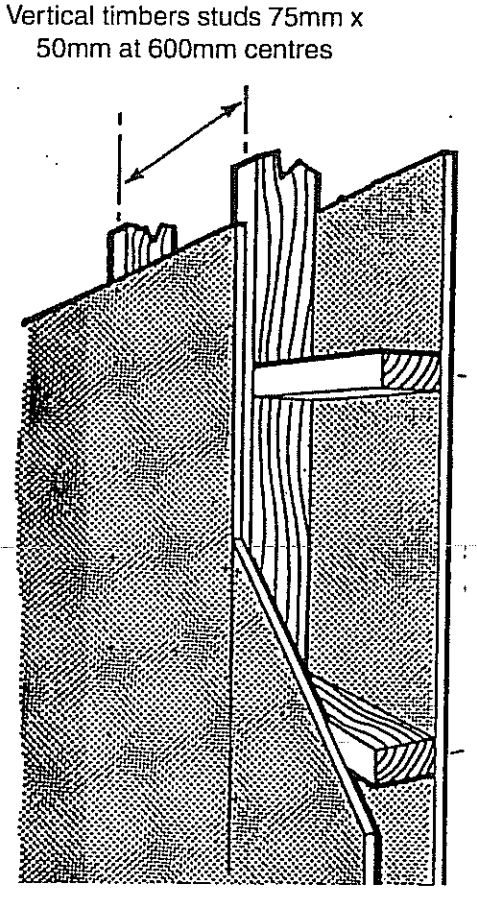


Figure 2.1 - Construction of timber stud partition

Increasing the size of timber studs and/or providing some infill products such as *Rockwool* can reduce thickness of the board required but advice should be sought from Manufacturers before approval for any variation on the specifications listed in the following paragraphs is given.

Caution : If, for any reason, an additional load is to be applied to a floor either by fixing additional boards to an existing partition or by constructing a new and heavier partition it may be necessary to strengthen the existing floor joist(s) supporting the partition. The Building Control department should be consulted in all cases.

1.5 Further information on fire resistance of timber stud partitions can be obtained from BS 5268 : Part 4 : 1990, clause 4.2 - Structural Use of Timber and from Manufacturers' Technical Services Departments.

The following paragraphs 2.0 & 3.0 provide information supplied by four manufacturers whose products are listed below. If other manufacturers' products are to be used then they will have to be independently assessed. Note that this also applies if plasterboard is supplied by any manufacturer other than British Gypsum.

- *Gyproc Wallboard* is manufactured by British Gypsum Ltd. and it is that company's trade name for plasterboard.
- *Gyproc Fireline board* and *Glasroc Multi-Board* are manufactured by British Gypsum Ltd
- *Supalux* and *Masterboard* are manufactured by Cape Boards Ltd
- *New Tacboard* and *New Tacfire* are manufactured by Promat Fire Protection Ltd
- *Rockwool Timberbatts* and *RW2 Slabs* are manufactured by Rockwool Linited

2.0 THE FOLLOWING FORMS OF CONSTRUCTION WILL PROVIDE 30 MINUTES FIRE RESISTANCE

2.1 New Partitions

2.1.1 Solid masonry wall (with or without plaster finish) at least 90mm thick (75mm thick if non loadbearing).

2.1.2 75mm x 50mm timber stud loadbearing/non loadbearing partition. Studs at maximum 600mm centres and no infill with the following facings **on both sides**:

- 12.5mm *Gyproc Wallboard* fixed with 40mm galvanised nails to every timber support at 150mm centres. Joints taped and filled or surface scrimmed and skimmed. (Figure 2.2)

- 6mm *Glasroc Multi-board* fixed with 40mm galvanised nails to every timber support at 150mm centres. Joints taped and filled or surface scrimmed and skimmed. Studs to be at maximum 400mm centres. (Figure 2.2)

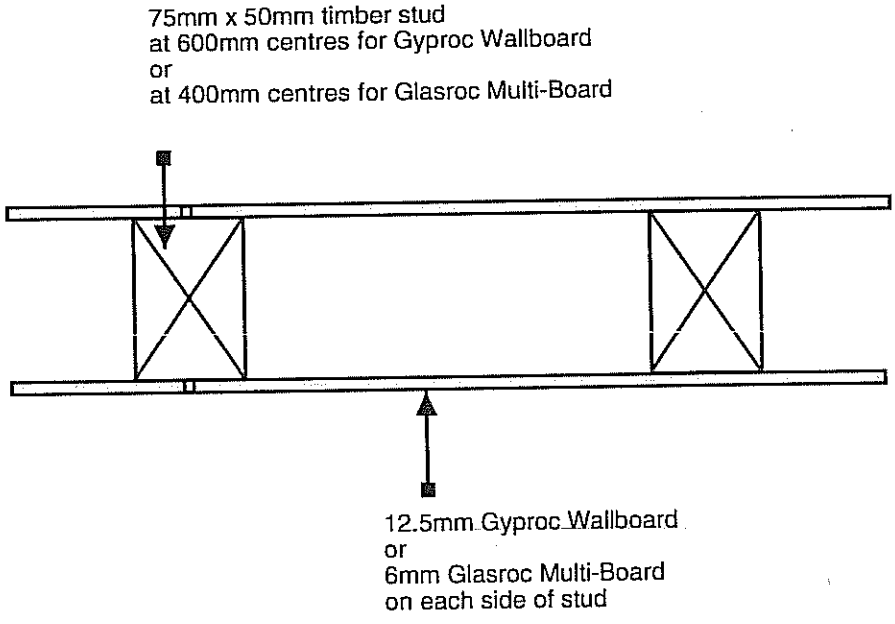


Figure 2.2 - Use of Gyproc Wallboard or Glasroc Multi-Board to provide a partition with 30 minutes fire resistance

- 9mm *Supalux* or *Masterboard* fillets, 75mm wide fixed to face of studs, 9mm *Supalux* or *Masterboard* fixed with 50mm nails at 300mm centres.
  (Figure 2. 3)
  (Fillets not required if partition is non loadbearing).

- 9mm *New Tacfire* or *New Tacboard* fillets, 75mm wide fixed to face of studs, 9mm *New Tacboard* or *New Tacfire* fixed with 50mm nails at 200mm centres.
  (Figure 2. 3)
  (Fillets not required if partition is non loadbearing)

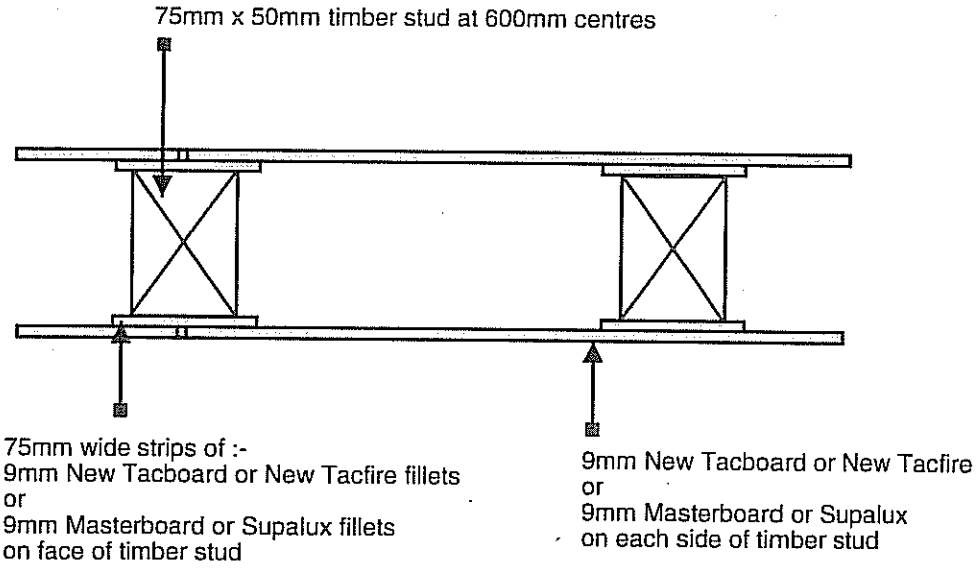


Figure 2.3 - Use of New Tacboard, New Tacfire, Masterboard or Supalux to provide a partition with 30 minutes fire resistance

- Expanded metal lathing to BS 1369 : Part 1 : 1987 securely fixed to the timber studs. Plaster with 13mm lightweight Gypsum metal lathing type (11mm *Carlite bonding* and 2mm *Carlite finish* or *Thistle Hardwall* and *Thistle Multi-Finish*).

2.1.3 In some cases, it will not be possible to fix a facing **on both sides** of the partition. For example if an existing facing, which is not fire resisting, cannot be removed e.g. a wooden spandrel to a staircase in a listed building. In these situations **specifications 1 or 2** below can be used.

The specifications concern a non-loadbearing solid construction which will provide a fire resistance of up to 60 minutes. They should only be used in constructions of up to 3 metres in height (No specific 30 minute specification is available)

Specification 1 (Figures 2.4 & 2.5)

The partition consists of one layer of 20mm *Supalux* and one layer of 15mm *Supalux*. Vertical board joints are staggered nominally half the board width (i.e. typically 610mm) between the layers and the horizontal joints staggered by at least 300mm between layers.

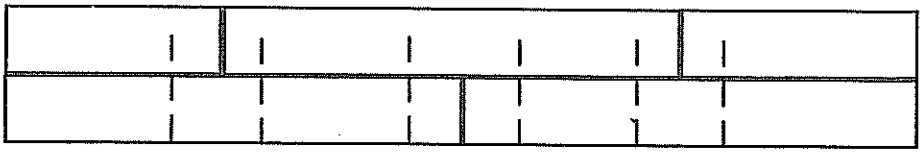


Figure 2.4 - Use of Supalux to provide a solid partition with 30/60 minutes fire resistance

- 32mm x 32mm x 20 gauge continuous mild steel angles fixed with 32mm No 8 screws at 300mm centres into non combustible plugs.
- Fix 20mm *Supalux* to the angles with 32mm No 8 self tapping screws at 300mm centres
- Fix the two layers together with 32mm No 8 self tapping screws at 300mm centres on both sides of the horizontal and vertical joints.

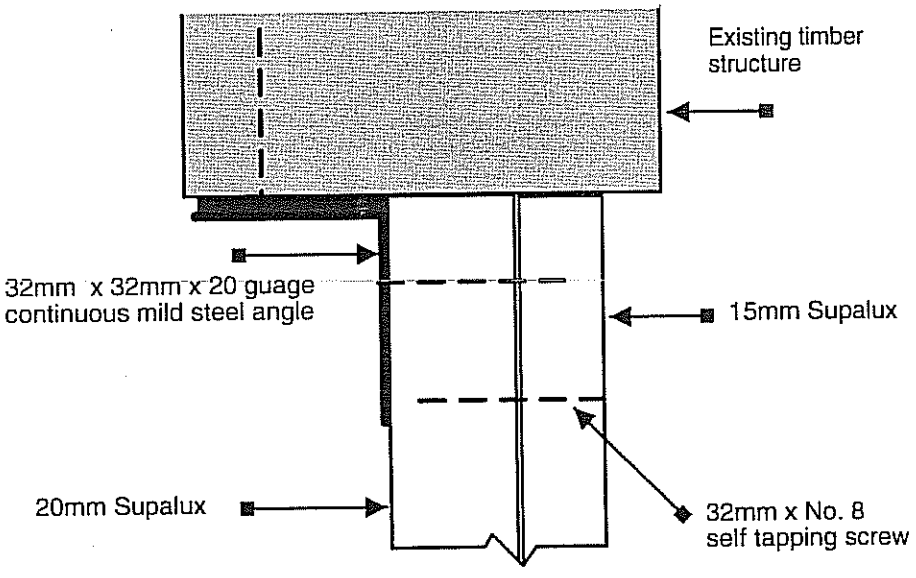


Figure 2.5 - Use of Supalux to provide a solid partition with 30/60 minutes fire resistance (Fixing details)

Specification 2 (Figure 2..6)

- 25mm x 50mm x 0.8mm galvanised steel perimeter angle secured to the perimeter using steel screws or bolts and plugs at 500mm centres.
- 30mm self drilling/tapping screws at 200mm centres secure 20mm layer of *New Tacfire* to perimeter angle.
- 35mm self drilling/tapping screws at 300mm centres secure 15mm layer of *New Tacfire* to the first layer, around the perimeter and down the centre of each board
- Any joints in *New Tacfire* boards must be staggered by at least 350mm

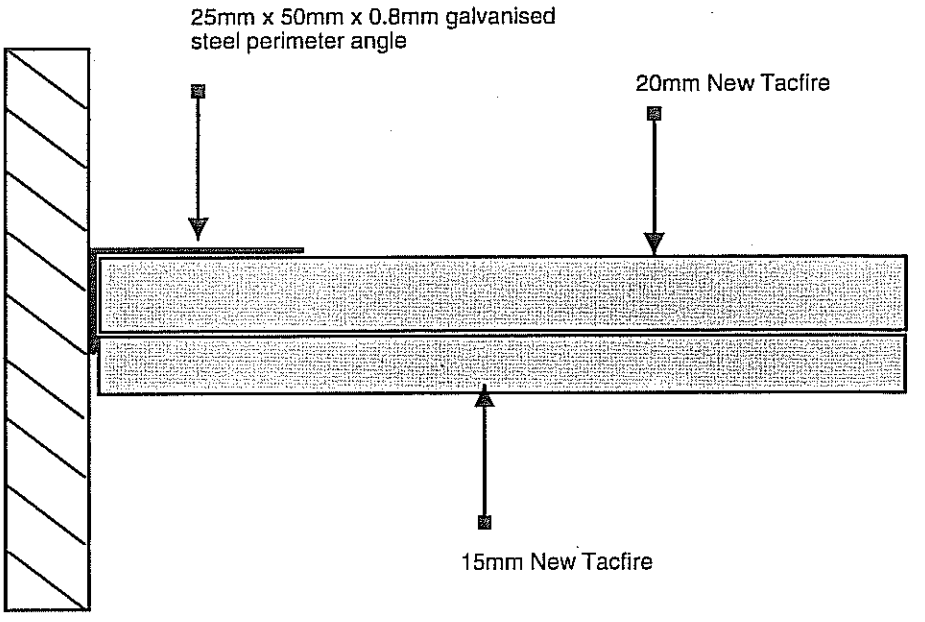


Figure 2.6 - Use of New Tacfire to provide a solid partition with 30/60minutes fire resistance

2.2 Existing Partitions

Where there is an existing lath and plaster covering to the partition it is unlikely that it will provide 30 minutes fire resistance. No tests are available for walls. However, it is believed that a purpose built lath and plaster ceiling would not provide more than 18 minutes fire resistance (Section 1 - Ceilings).

The following methods can be used to upgrade an existing (lath and plaster) partition made up of 75mm x 50mm timber studs which is either loadbearing or non loadbearing. The studs at maximum 600mm centres with no infill provide a partition with 30 minutes fire resistance when upgraded.

Partitions can be upgraded in one of two ways :-

2.2.1 By the provision of an additional board to the existing facing **on both sides.**

- 6mm *Masterboard* fixed on each side of the partition using 63mm nails or screws at 300mm centres.
- 6mm *New Tacfire or New Tacboard* fixed at 200mm centres using nails or 300mm centres using screws. The length of the nails/screws should be such that they penetrate 38mm into the stud.
- 6mm *Glasroc Multi-Board* fixed on each side of the partition using appropriate sized nails or drywall screws.

2.2.2 By the provision of a cavity infill.

- No tests are currently available using *Rockwool* for 30 minutes fire resistance. Refer to paragraph 3.2.2 for partitions providing 60 minute fire resistance.

3.0 THE FOLLOWING FORMS OF CONSTRUCTION WILL PROVIDE 60 MINUTES FIRE RESISTANCE :

3.1 New Partitions

3.1.1 Solid masonry wall (with or without plaster finish) at least 90mm thick (75mm thick if non loadbearing).

3.1.2 75 x 50mm timber loadbearing/non loadbearing stud partition. Studs at 600mm centres and no infill with the following facings **on both sides**. (Figure 2.1)

- 2 x 12.5mm *Gyproc Wallboard* fixed with 40mm (1st layer) and 50mm (2nd layer) galvanised nails to every timber support at 150mm centres. The joints to be staggered, then taped and filled or surface scrimmed and skimmed. (Figure 2.7)

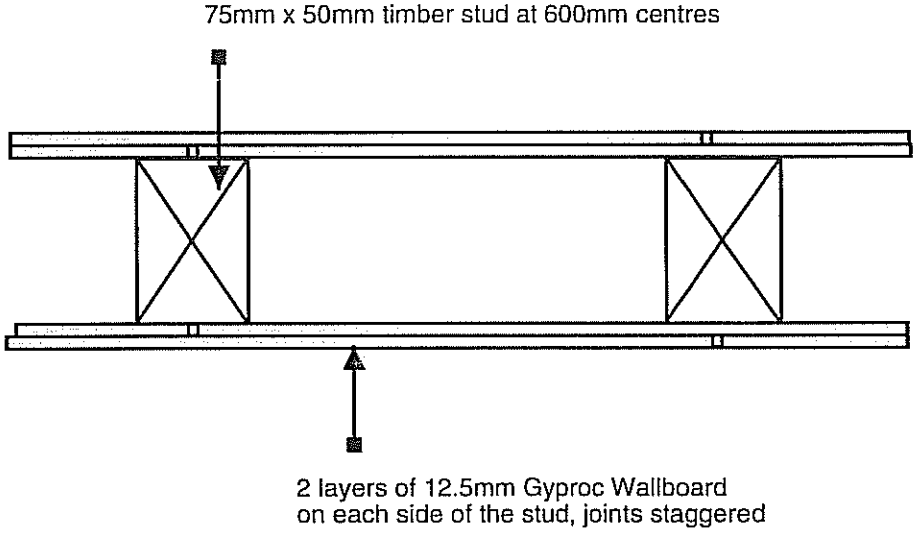


Figure 2.7 - Use of Gyproc Wallboard to provide a partition with 60 minutes fire resistance

- 15mm *Fireline board* (provided studs are 100mm x 50mm) fixed with 50mm galvanised nails to every timber support at 150mm centres. The joints to be taped and filled or surface scrimmed and skimmed. (Figure 2.8)

- 12.5mm *Glasroc Multi-Board* fixed with 50mm galvanised nails fixed to every timber support at 150mm centres. The joints to be taped and filled or surface scrimmed and skimmed. (Figure 2.8)

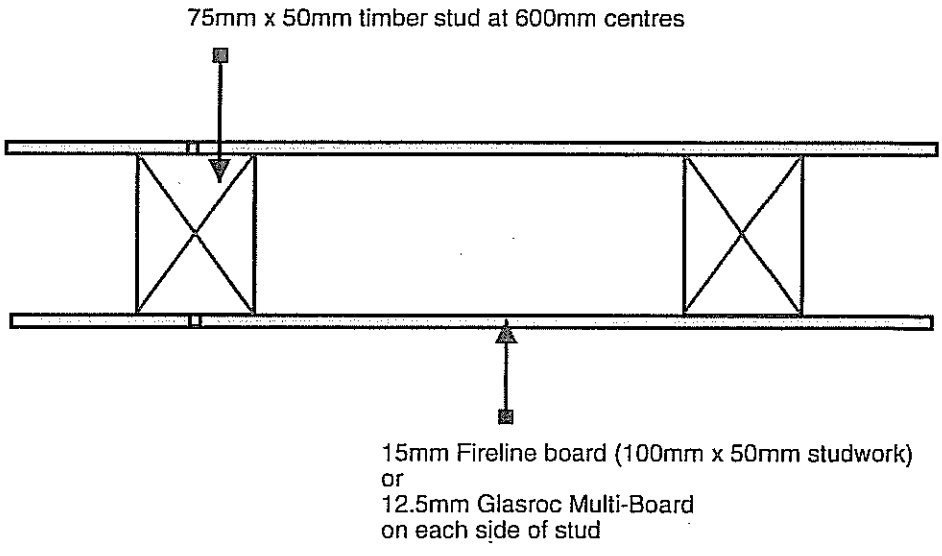


Figure 2.8 - Use of Fireline board or Glasroc Multi-Board to provide a partition with 60 minutes fire resistance

- 9mm *Supalux* fillets, 75mm wide fixed to face of studs, 2 layers of 9mm *Supalux*, joints staggered with 50mm nails at 300mm centres
  (Figure 2.9)
  (Fillets not required if partition is non loadbearing).

- 9mm *New Tacfire* fillets, 75mm wide fixed to face of studs, 15mm (6mm+9mm) *New Tacfire*, joints staggered fixed using 63mm x No. 8 screws at 300mm centres.
  (Figure 2.9)
  (Fillets not required if partition is non loadbearing)

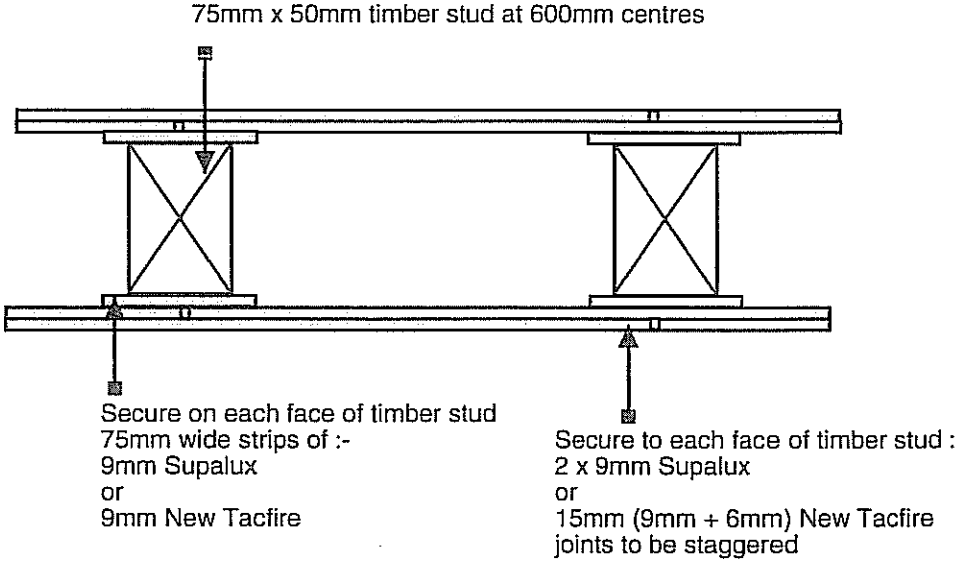


Figure 2.9 - Use of Supalux or New Tacfire to provide a partition with 60 minutes fire resistance

- Expanded metal lathing to BS 1369 : Part 1 : 1987 securely fixed to the timber studs. Plaster with 13mm lightweight *Gypsum metal lathing* type (11mm *Carlite bonding* and 2mm *Carlite finish* or *Thistle Hardwall* and *Thistle Multi-Finish*).

3.1.3 In some cases it will not be possible to fix a facing on **both sides** of the partition. For example if an existing facing, which is not fire resisting, cannot be removed e.g. a wooden spandrel to a staircase in a listed building. In these situations **specifications 1 or 2** below can be used.

The specifications concern a non-loadbearing solid construction which will provide a fire resistance of 60 minutes. They should only be used in constructions of up to 3 metres in height.

Specification 1 (Figures 2.10 & 2.11)

- The partition consists of one layer of 20mm *Supalux* and one layer of 15mm *Supalux*. Vertical board joints are staggered nominally half the board width (i.e. typically 610mm) between the layers and the horizontal joints staggered by at least 300mm between layers

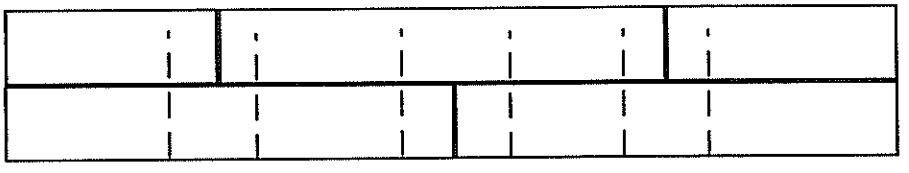


Figure 2.10 - Use of Supalux to provide a solid partition with 60 minutes fire resistance

- 32mm x 32mm x 20 gauge continuous mild steel angles fixed with 32mm No 8 screws at 300mm centres into non combustible plugs.
- Fix 20mm *Supalux* to the angles with 32mm No 8 self tapping screws at 300mm centres
- Fix the two layers together with 32mm No 8 self tapping screws at 300mm centres on both sides of the horizontal and vertical joints.

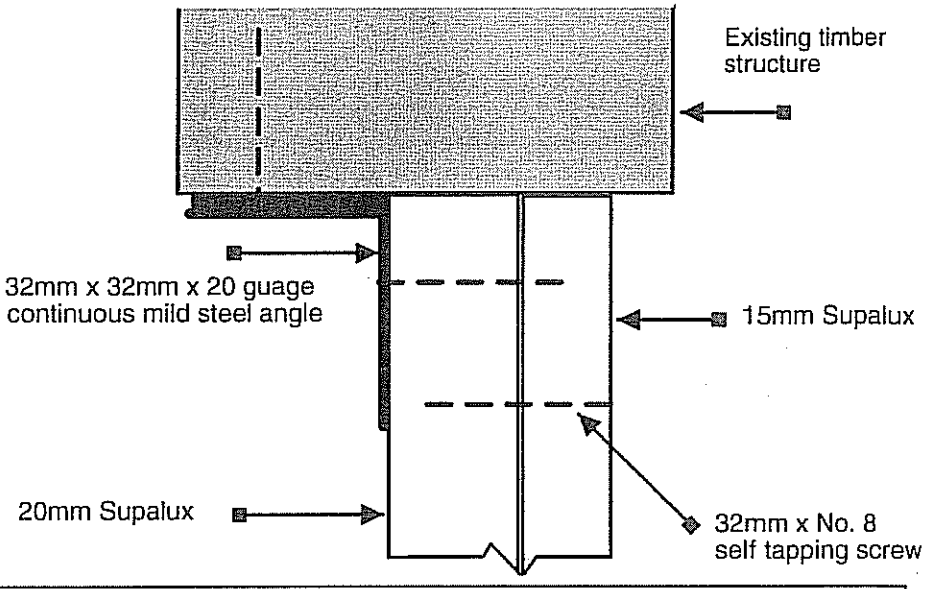


Figure 2.11 - Use of Supalux to provide a solid partition with 60 minutes fire resistance (Fixing details)

Specification 2 (Figure 2.12)

- 25mm x 50mm x 0.8mm galvanised steel perimeter angle secured to the perimeter using steel screws or bolts and plugs at 500mm centres.
- 30mm self drilling/tapping screws at 200mm centres secure 20mm layer of *New Tacfire* to perimeter angle
- 35mm self drilling/tapping screws at 300mm centres secure 15mm layer of *New Tacfire* to the first layer, around the perimeter and down the centre of each board
- Any joints in *New Tacfire* boards must be staggered by at least 350mm

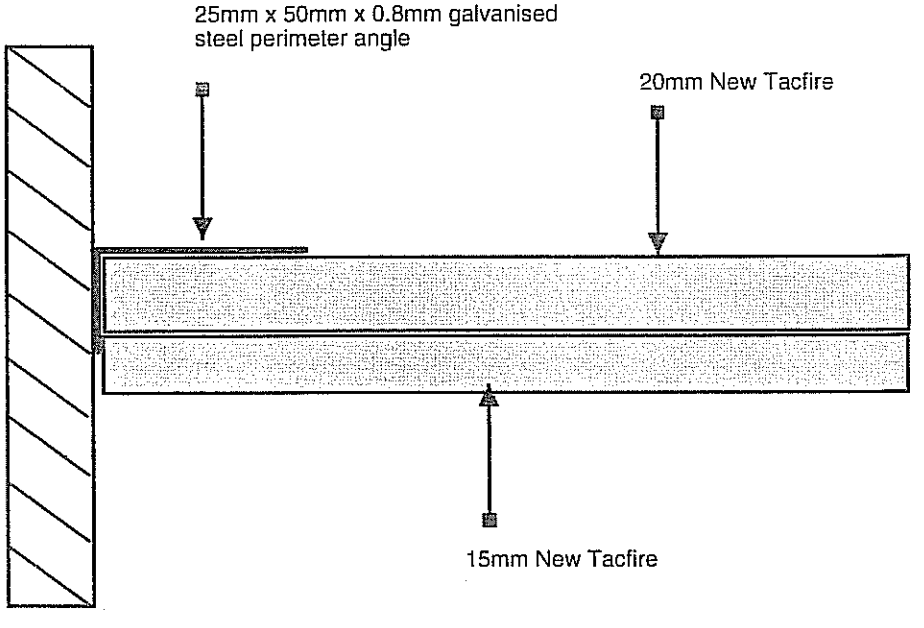


Figure 2.12 - Use of New Tacfire to provide a solid partition with 60 minutes fire resistance

3.2 Existing partitions

There are two circumstances where it may be preferable to upgrade an existing partition to provide 60 minutes fire resistance.

- Where there is an existing lath and plaster covering to the partition.
- Where an existing 30 minute partition, covered with 12.5mm plasterboard, must be upgraded to provide 60 minutes fire resistance

The following methods can be used to upgrade an existing (lath and plaster) partition made up of 75mm x 50mm timber studs which is either loadbearing or non loadbearing. The studs at maximum 600mm centres with no infill to provide a partition with 60 minute fire resistance when upgraded.

Partitions can be upgraded in one of two ways:

3.2.1 By the provision of an additional board to the existing facing **on both sides**

- 9mm *Supalux* fixed, on each side of the partition, using 63mm nails or screws at 300mm centres.
- 12mm *New Tacfire* fixed, on each side of the partition, using screws at 300mm centres. The length of the screws should be such that they penetrate 38mm into the stud.

3.2.2. By the provision of a cavity infill.

In this case it must be a non-loadbearing stud partition made up of minimum 89mm x 38mm studs at 600mm centres with no infill and covered with 12.5mm plasterboard.

- Take off one face of the existing partition. Fill the cavity between the studs with 90mm *Rockwool Timberbatts* of density 23Kg/m³. Provide 12.5mm *Gyproc* Wallboard fixed at 150mm centres with 38mm galvanised nails. Joints taped and filled or surface scrimmed and skimmed. (Figure 2.13)

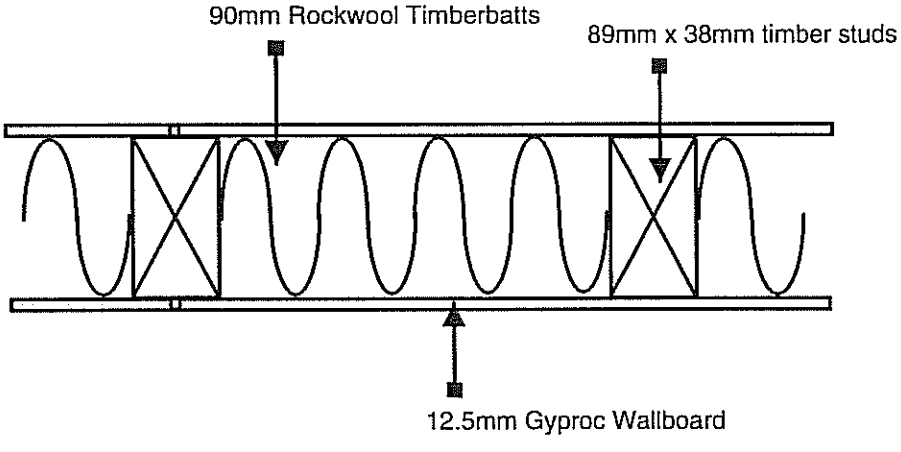


Figure 2.13 - Use of Rockwool within the timber stud to provide 60 minutes fire resistance

- Alternatively, if the timber studs are 100mm x 38mm at 600mm centres and covered with 12.5mm plasterboard the cavity between the studs can be filled with 100mm *Rockwool RW2 slabs.*

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Telephone: (Freephone) 0800 591202

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South Yorkshire,
DN5 9LR

Telephone: 01302 783333

Facsimile: 01302 787383

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FIRE RESISTING DOORS

1.0 INTRODUCTION

30 minute fire resisting partitions to be fitted with 30 minute **fire resisting door assemblies.**

60 minute fire resisting partitions to be fitted with 60 minute **fire resisting door assemblies.**

30 minute doorsets are specified as FD30. 60 minute doorsets are specified as FD60. The 30 or 60 figure denotes the integrity performance time of the door in minutes. A letter S after the figure (e.g. FD30S) denotes a requirement for smoke seals to be fitted.

Note : 60 minutes resistance is required to **areas of higher fire risk** such as large boiler rooms, large stores, commercial areas and doors in separating party walls between properties.

2.0 TYPES OF DOOR & FRAME ASSEMBLIES

Four alternatives will be encountered by the inspecting officer :

- New purpose built-fire door and frame assemblies (2.1)
- New purpose-built fire door leaves fitted to existing frames (2.2)
- Purpose built fire doors to an earlier standard (2.3)
- Upgrading existing non-fire-resisting doors (2.4)
- Smoke control doors (2.6)

2.1 New purpose-built door and frame assemblies

- Assembly to provide 30 minutes fire resistance in terms of ***integrity*** when tested or assessed to BS 476 : Part 22 : 1987.
- Assembly to provide adequate smoke sealing when tested to BS 476 : Part 31.1. (paragraph 2.5.10 of this Guide).
- Assembly to be installed and maintained in accordance with BS 8214 : 1990.

Valid evidence of performance will be required as follows :.

- Where the assembly is identical to the sample tested in all ways e.g. size, ironmongery, frame etc. this will take the form of a ***fire test report*** from a ***UKAS (ex. NAMAS) registered testing house,***
- Where the assembly varies from the sample tested this will take the form of an ***assessment*** or ***field of application report*** issued by a ***suitably qualified person*** instead of or in addition to a test report from a *UKAS* registered testing house.

The following laboratories are currently accredited by *UKAS* for the purpose of performing tests to BS 476 : Part 22 : 1987 on door and frame assemblies (doorsets).

- *The Building Test Centre, British Gypsum Ltd.,*
- *Chiltern International Fire Ltd.* (Formerly *TRADA*)
- *Faverdale Technology Centre Ltd.,*
- *The Loss Prevention Council,*
- *Warrington Fire Research Centre Ltd.,*

The specification used on site must correspond in all respects to that specified in either the test report or the assessment/field of application report including the specifications for intumescent strips, smoke seals, self-closers and ironmongery. **Variations from the documented specification may adversely affect the performance of the door.** Ideally door and frame sets should be supplied as a package thereby overcoming the potential problem of doors being fitted to frames different to the ones with which they were tested. However in practice this may not be the case.

2.1.1 30 minute purpose built new fire door and frame assemblies

Three types of construction are commonly encountered :

- **Framed-Up Solid Core Flush Doors :** softwood framing with in-fill core panels of various materials e.g. timber, flaxboard, cork, particle board, fibre board etc. with facings of plywood, hardboard or wood particle-board. Often lipped with hardwood or softwood. Assembled with non-thermally softening glue.

- **Solid Timber Flush Doors :** laminated timber strips faced with plywood or other boards. Assembled with non-thermally softening glue.

- **Panelled Traditional Style Doors :** a number of proprietary constructions are on the market. Test or assessment documentation must be available to validate their performance.

Intumescent strips and cold smoke seals are usually fitted as a single strip and can usually be interrupted at hinges and locks.

Traditionally the thickness of 30 minute doors was 44mm. Thickness is now no longer a reliable guide to fire resistance and the test or assessment documentation must be relied upon to validate their performance.

The assembly's frame dimensions should not be less than that tested or approved unless a smaller dimension has been assessed as being acceptable by a ***suitably qualified person.*** The frame must be adequate to maintain the normal mechanical function and durability of the door.

2.1.2 60 minute purpose built new fire door and frame assemblies

Four common constructions may be encountered :

- **Framed-up solid core flush doors :** Constructed as for 30 minute doors of this type but density of framing increased and core often replaced by non combustible products. In some doors the core panels are of non-combustible boards. 60 minute doors are usually lipped all round with hardwood.

- **Solid timber flush doors :** More difficult to produce than the 30 minute counterpart but are feasible with use of certain core materials and facings. 30 minute design often uprated by incorporating non-combustible boards under the facings of the doors.

- **Non-combustible cored flush doors :** Consist of thick boards of non-combustible material with timber based facings.

- **Panelled traditional style doors** : a number of proprietary constructions on the market. Test or assessment documentation must be available to validate their performance

Traditionally the thickness of 60 minute doors was 54mm. Thickness is now no longer a reliable guide to fire resistance and the test or assessment documentation must be relied upon to validate their performance.

The assembly's frame dimensions should not be less than that tested or approved unless a smaller dimension has been assessed as being acceptable by a ***suitably qualified person.*** The frame must be adequate to maintain the normal mechanical function and durability of the door. Frame dimensions are typically not less than 40mm x 70mm.

The specification for intumescent strips is usually twice that for 30 minute doors and ironmongery positions must be protected as detailed in BS 8214 : 1990 (Section 4 - Door Hardware, paragraph 2.3).

2.2 New purpose built door leaves fitted into existing frames

The manufacturer's test or ***assessment report*** for the new door leaf must be consulted and the specification for the frame noted. Where the existing frame is of a specification equal to or greater than that specified in the report it should be possible to fit the new door leaf into it. Prior to fitting, the frame must be examined to ensure it is sound, undamaged and unadulterated. Any damaged sections, loose knots etc. to be replaced with timber of equal dimensions and density. The frame must be squared in the opening and any gaps between the frame and the wall may require filling with intumescent paste or mastic (paragraph 2.5.5).

The new door leaf is to be hung in the existing frame using ironmongery which is identical to that quoted in the report. The length of screws used should be sufficient to firmly attach the frame to the wall. The frame or leaf edge must contain intumescent strips and cold smoke seals of an identical specification to those specified in the report. **It is imperative to note that there should be no variation in the final specification from that contained in the test or assessment documentation unless the variation has been assessed as being acceptable by a *suitably qualified person*.. Any such unauthorised variation may prejudice the performance of the door in a fire situation.**

It is unlikely that 60 minute fire resisting door leaves can successfully be fitted into existing frames owing to the additional weight of the new door leaf. For 60 minute fire resisting situations the fitting of new purpose built door leaf and frame sets is recommended. However, where existing door frames are of a particularly substantial construction consideration may be given to their retention. In such cases the door leaf manufacturer must be consulted to establish the frame's suitability for both fire resistance performance and durability in use.

2.3 Purpose built fire doors to an earlier standard

Door assemblies will be encountered which were tested to, or constructed in accordance with, earlier standards :

- Tested to BS 476 : Part 1 : 1953
- Tested to BS 476 : Part 8 : 1972
- Constructed in accordance with a constructional standard e.g. BS 459 : Part 3.

These doors may be retained and upgraded to current standards (i.e. the test standards of BS 476 : Part 22 : 1987) provided they are completely sound, undamaged and unadulterated. The following works will be required :

- Frame to be sound, undamaged, made square if distorted and firmly fixed to the wall.
- Any gaps between the frame and the opening behind the architrave may require filling with intumescent paste/mastic (paragraph 2.5.5)
- Where the door is binding with the frame, relieve the door by removal of minimal amounts of timber equally from door and frame. However, lippings, where fitted, should not be planed to less than 6mm thickness.
- Gaps between the frame and leaf greater than 4mm (ignoring the smoke seal) to be eliminated by lipping door with solid timber of equivalent density butt jointed to the core edge. The minimum permitted thickness of timber lipping is 6mm. Lipping may be fixed in place with non-thermally softening (thixotropic) adhesive.
- Fit intumescent strips and cold smoke seals centrally in the edge of the door leaf or in corresponding position in frame, down both sides and along head of door. The type of intumescent strip is critical and the advice of the manufacturers must be sought and adhered to. However, for single leaf latched door assemblies, seals which have satisfied integrity when tested to clause 6 of BS 476 : Part 23 : 1987 for the appropriate duration should be suitable for doors tested to BS 476 : Part 22.

On completion the door is to be close fitting in the frame (maximum gap 4mm ignoring smoke seal) and effectively self closing to engage the latch. If unlatched, the closing device must retain the door leaf in the closed position. (Section 4 - Door Hardware)

2.4 Upgrading Existing Non-Fire Resisting Doors

2.4.1 The upgrading of non-fire-resisting door assemblies is to be avoided where possible. The practice is generally impractical and uneconomic. It is reliant upon strict adherence to an approved specification and upon a high standard of workmanship.

However, for aesthetic reasons, it may be necessary to upgrade existing doors. This will apply particularly in buildings of specific architectural interest, e.g. listed buildings, in which case it will be important to maintain the appearance of the door. In listed buildings, upgraded measures which are non-invasive and reversible are preferred.

Whenever possible though, existing non-fire-resisting door assemblies should be replaced with purpose designed and built fire-resisting door assemblies (paragraphs 2.1 and 2.2).

2.4.2 In each case where a door leaf is being considered for upgrading, a detailed specification of the leaf with accurate dimensions of each of its components, its method of construction including, where known, any adhesives, must be submitted to a ***suitably qualified person*** in order to assess its suitability for upgrading. Where the assessor is satisfied that the leaf can be upgraded, then a suitable technique will be specified and a report giving the assessed integrity rating will be prepared. Each variation of door type will require assessment in this way. Where the subject door is not similar to any door previously subjected

to a fire test, an ***assessment report*** may still be issued subject to additional measures being carried out. The ***assessment report*** will detail these measures and they must be strictly adhered to.

2.4.3 Many published solutions for upgrading doors address the problem of the leaf burning through, either through the panel or panel/stile/rail interface. Most door leaves deflect badly during fire exposure and it is important that any potential weaknesses in the behaviour of the leaf are addressed before contemplating how the panels may be upgraded.

2.4.4 Where an assessment report is not forthcoming, the only alternative will be to submit an identical sample door to a BS 476 : Part 22 : 1987 test at a *UKAS* registered test house. Note: this is a test to destruction and will only be possible where there are a number of identical subject doors of which one can be sacrificed. The test costs several thousand pounds.

2.4.5 Examples of methods of upgrading

It is not recommended to simply upgrade panels on the fire risk side of the door. A balanced construction works better and provides protection to the occupants inside the room if needed.

2.4.6 Specifications currently accepted are restricted to those published by *TRADA* in *TRADA*'s Wood Information Sheets or similar. Each method must be accompanied by a valid ***test report*** from a ***UKAS registered test house*** or ***assessment report*** from a ***suitably qualified person.***

It is imperative that the door to be upgraded is of a design and specification corresponding to the door upgraded and proven by test and that the specification given in the test report or field of application report is strictly adhered to. **Variations in the method or the products used from those specified in the test report or assessment report cannot be accepted.**

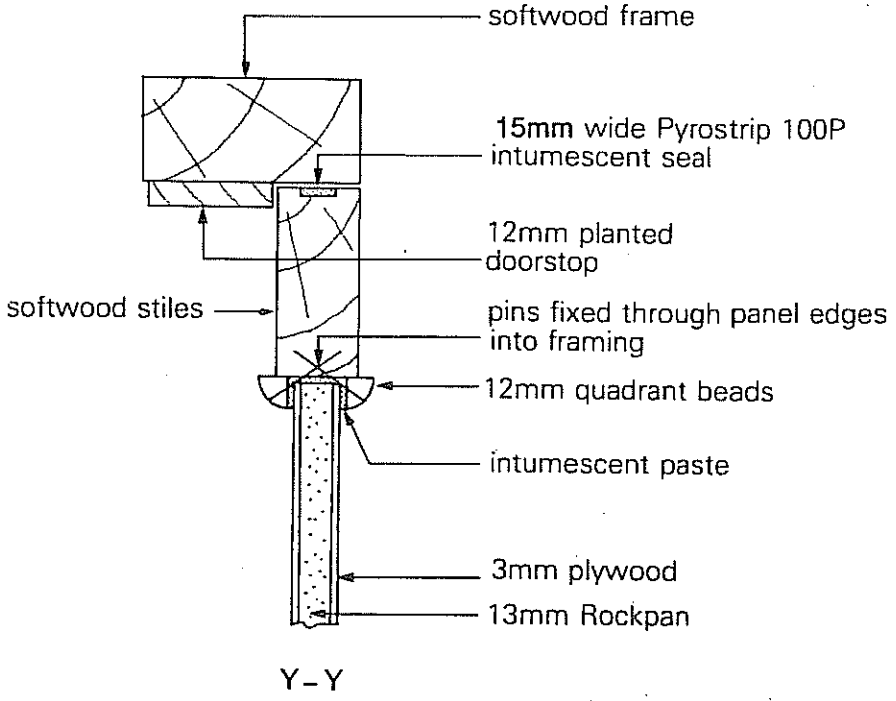
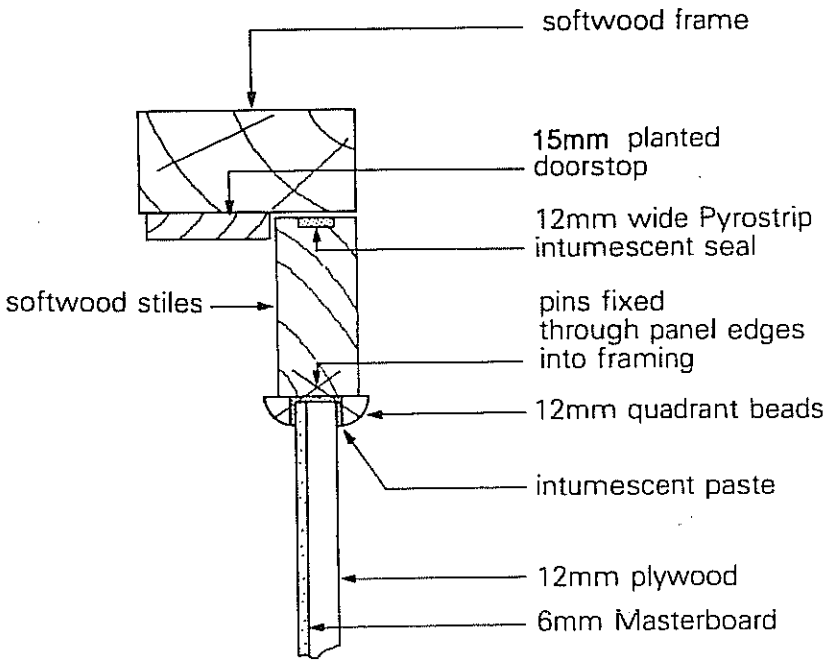
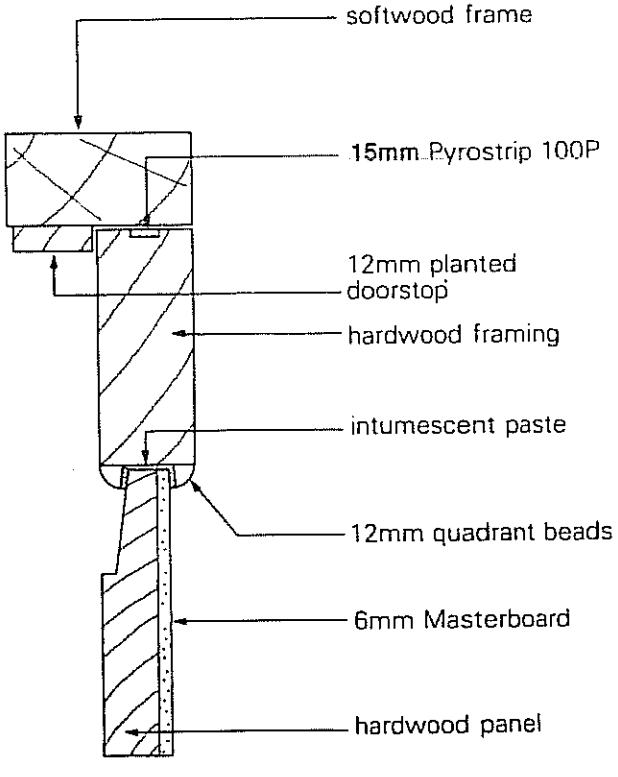


Figure 3.1 : TRADA D7 specification for upgrading doors



N.B. Masterboard fixed to risk side of door

Figure 3.2 : TRADA D8 specification for upgrading doors



W–W

N.B. Masterboard fixed to risk side of door

Figure 3.3 : TRADA D9 specification for upgrading doors

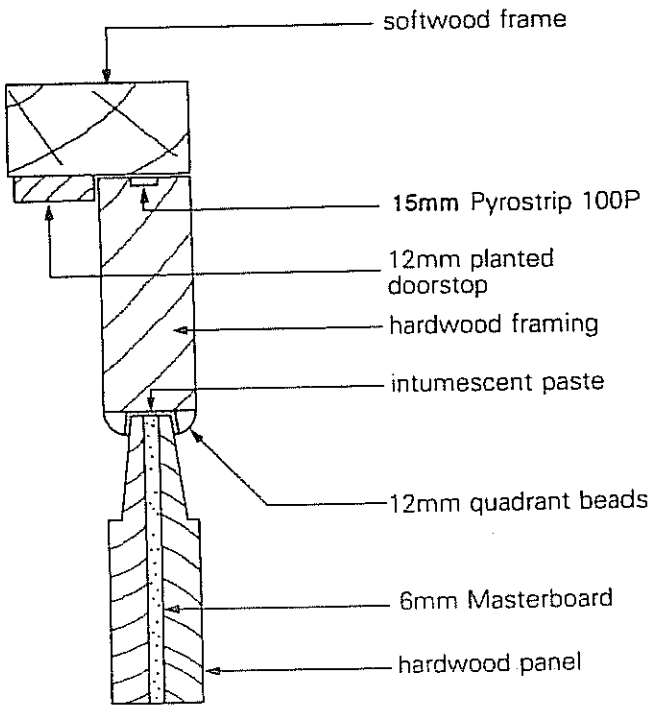


Figure 3.4 : TRADA D10 specification for upgrading doors

2.4.7 Proprietary methods of upgrading

In addition to the traditional methods mentioned above, proprietary products are now coming on to the market which offer a simple method of upgrading by surface fixing sheets of protective material to the face of the door. Great care must be exercised when considering the use of these products. Valid evidence of performance supported by test data from a ***UKAS registered test house*** must be obtained from the manufacturer of the product and studied carefully. Small variations in the material or the method of upgrading can have dramatic effects on the performance of the door in a fire. Only when the evidence of performance is satisfactory may the product be considered for use in upgrading.

2.4.8 To ensure the applicability of the method to the door in question it is recommended that a detailed specification of the door to be upgraded, with accurate dimensions of each of its components, be submitted to a ***suitably qualified person*** for an assessment of its suitability for upgrading and the likely result. Where the assessor is satisfied that the proposed method of upgrading will meet the required standard for that door they will issue an ***assessment report*** to that effect. It will be necessary to carry out an assessment for each subject door unless they are all of a similar type, size and construction. Where there are variations in construction, the ***assessment report*** may list acceptable variations which are covered by that assessment. This is commonly known as a ***field of application report***. It is essential that the product manufacturer's specification is accurately followed, together with any additional recommendations made in the ***assessment report***. Any variation may affect the performance of the door in a fire situation.

2.4.9 There are a number of different types of proprietary products currently available with a wide range of fire test evidence. One such type is a thin intumescent sheet material often erroneously referred to as 'intumescent paper'. The only such product currently recognised by the Association of Specialist Fire Protection (ASFP) is:

Fireface by *Sealmaster Ltd*, Pampisford, Cambridge (Figure 3.5)
Tel No : 01223 832 851

This is a three layer material comprising :

- a base bonding layer to prevent tearing when the panel tries to shrink or split
- an intumescent layer to provide insulation
- a surface layer to take veneer or paint

Fireface is surface fixed to **both** faces of the subject door using a special proprietary adhesive. It has been tested on flat, raised or fielded panels to provide 30 minutes fire resistance with or without beads even when applied direct to existing paintwork. This method has little effect on the appearance of the door and is non-invasive, often not requiring the paint to be removed. As it is reversible, it may be particularly suited for use in listed buildings. It is acceptable to *English Heritage.*

A full specification and copies of test reports are available from *Sealmaster Ltd.*

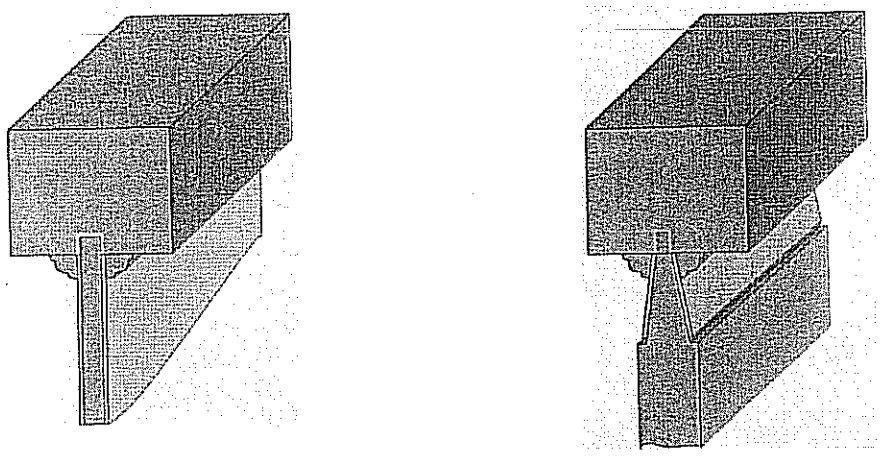


Figure 3.5 : *Sealmaster Fireface* shown on flat panels and on raised/fielded panels

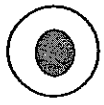
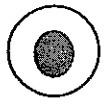
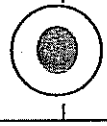
2.5 Technical Points Applicable to all Categories of Fire Doors

2.5.1 Thickness of door leaf

The thickness of the door leaf is no longer a reliable guide to fire resistance as some thin proprietary door leaves are now commercially available. However, traditionally 30 minute doors are 44mm thick; 60 minute doors are 54mm thick.

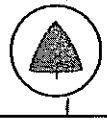
2.5.2 Indication of fire resistance by colour coded plugs

A colour coded plug in the edge of the door leaf indicates the fire resistance of the door (Figure 3.6). Where the plug in the edge of a fire door incorporates a 'tree' symbol this indicates that it is a Quality Assured door leaf under the *TRADA QA scheme.*(Figure 3.7).

Fire Resistance Ratings	Intumescent Necessary	Intumescent Not Necessary Green Core
30/20 (white background)		
30/30 (yellow background)		
60/60 (blue background)		
With specified intumscent in frames or doors 30/30	White background Blue core 	

30/20 indicate 30 minutes integrity performance, 20 minutes insulation performance etc.

Figure 3.6 : Colour coded plugs in the edge of fire door leaves indicating the fire resistance of the leaf

Fire resistance rating to BS 476 : Part 8 : 1972 or BS 476 : Parts 20/22 : 1987	Intumescent Material to be fitted on site to door manufacturer's instructions	Intumescent material fitted by door manufacturer during production
FD20 (white background)		
FD30 (yellow background)		
FD60 (blue background		
With specified intumescent seal fitted FD30 Without seal FD20		

Additional colour codes are available for other fire resistance ratings, e.g. FD90 - brown background; FD120 black background; the tree colour varying with the intumescent requirements.

Figure 3.7 : Colour coded plugs in the edge of fire door leaves indicating the fire resistance of the leaf under the TRADA Quality Assurance Scheme

2.5.3 Self-closing devices

Suitable self-closing devices are required in all cases (except doors to cupboards). Where latches are not fitted, the device must retain the door leaf in the closed position until the intumescent seal has been activated. (Section 4 - Door Hardware)

2.5.4 Rebated meeting edges to double leaf doorsets

These are to be avoided, as separation between the leaves due to distortion occurs more quickly during fire than with plain leaf edges, which is detrimental to the efficiency of intumescent strips.

2.5.5 Frame/Wall Junctions

The gap between the frame and the wall/partition (behind the architrave) is to be kept to a minimum.

Any gap is to be filled with a bead of intumescent mastic **except** in the following situations where further protection is not necessary:

- 30 minute, non-load bearing walls where the gap is less than 10mm and well fitting architraves, of minimum thickness 15mm with 15mm overlap onto the wall and frame are fitted
- 30 minute, load bearing walls where the gap is less than 10mm and a 19mm quadrant bead is intimately fitted

For 60 minutes fire resistance all gaps (of any size) are to be filled with a bead of intumescent paste or mastic.

For greater detail and alternative methods of protection refer to Tables 2 and 3 in BS 8214 : 1990.

2.5.6 Leaf/Frame Gap

This is not to exceed that specified in the ***test report.*** As a rule of thumb, the maximum gap is to be 4mm (ignoring the smoke seal). Gaps less than 3mm may inhibit the self closing action of the door when smoke seals are fitted. Gaps greater than 4mm are detrimental to the efficiency of smoke seals. The gap at the threshold is not critical, but for practical reasons it should be as small as is possible (BS 8214 : 1990 reccomends a maximum gap of 8mm).

2.5.7 Frames

Size: Should not be less than that in the ***test report*** or ***assessment*** documentation. The frame must be adequate for the mechanical operation and durability of the door, and must be of sufficient section to accept the specified ironmongery.

Frames are to be of straight grained timber of a density not less than that specified in the ***test*** or ***assessment report.*** Voids, imperfections, wild grain, unsound knots or areas of material damage to be avoided.

If the frame is not supplied by the door leaf manufacturer, guidance must be sought from them on suitability. The specification in the door leaf ***test report*** is to be regarded as a minimum unless subjected to an ***assessment*** by a ***suitably qualified person.***

The frame must be screwed securely into the opening.

Non-timber door frames may be encountered and must be treated with caution. Refer to BS 8214 : 1990 for guidance.

2.5.8 Door-stops

Contrary to popular belief the size of doorstop does not need to be increased. Indeed oversized doorstops may inhibit the effectiveness of the intumescent strip. Doorstops need only be sufficient to retain the door in the mechanical sense.

2.5.9 Intumescent strips

Intumescent strips and cold smoke seals are required to both edges and to the head of the door in all cases.

- Must be tested or assessed against BS 476 : Part 22 : 1987.
- Must be fitted to both jambs and the head of door, but are not required at the threshold.
- Must be fitted centrally in the door edge or in the corresponding position within the frame. They may be glued in a groove, but the type of glue is not critical, or they may be fixed with panel pins. In listed buildings they may require surface fixing.
- May be interrupted at the hinges/locks for 30 minute doors but not for 60 minute doors.
- Imperative that the intumescent material used is the same as that specified in the original door assembly as tested and as specified in the ***test*** or ***assessment report***. Variations on the type of intumescent material are possible with single leaf latched door assemblies but the intumescent seal used must satisfy Clause 6 of BS 476 : Part 23 : 1986, and may only be applied to doors that fall within the ***field of application*** given in that standard.
- Concealed intumescent strips behind door lippings are permitted only in factory-made proprietary door assemblies supported by specific test evidence for this detail. On-site concealed fitting of the strip is not acceptable.
- Recommended that intumescent strips are not painted over to aid identification on inspection. However this may need to be relaxed in listed buildings for aesthetic reasons.

2.5.10 Smoke seals

- Must be tested in a ***door and frame assembly*** to BS 476 : Part 31.1 (smoke leakage through head and jamb not to exceed $3m^3/m/hour$ at 25Pa pressure - source BS 5588 : Part 3 and Approved Document B of the Building Regulations)
- To be fitted down both sides and along the head of the door or frame, but not required at the threshold.
- May be combined with an intumescent strip.
- Gap at the bottom of the door to be kept to the minimum practicable.
- To be glued or pinned in groove - type of glue not critical.
- Must never be painted over.

2.5.11 Apertures

Ventilation Grilles: These are not permitted, even the intumescent types, as they do not have any smoke control performance.

Letterboxes: These are to be avoided if possible. However, evidence of fire resistance performance may be available in certain assemblies with accompanying ***test reports***. In such cases they must be fitted between 800mm and 1000mm from the door threshold. Maximum aperture size 250mm x 38mm; to comply with BS 2911 and have well fitting sprung or gravity internal and external flaps. They cannot be fitted ad-hoc on site. Only factory fitting is permitted unless a ***test*** or ***assessment report*** for the exact door assembly is provided. They should not be used on smoke control doors unless test evidence is available. For more details refer to Section 4 Door Hardware.

Door Viewers (Spy Holes): Refer to Section 4 - Door Hardware, paragraph 5.2.

2.5.12 Glazing

It is not permitted to fit glazing to existing doors which were not designed for the purpose. Doors with glazing panels are permitted but only where purpose-designed, built and tested to BS 476 : Part 22 : 1987. Such doors are often sold without the glazing panel. If so, glazing details on site must be identical to those in the door manufacturer's documentation. **Any deviation in glazing type or fixing detail may affect the door's performance in a fire situation.**

2.5.13 Facings

If the door face is to be clad with a decorative panel or finish it must be fitted to both faces of the leaf to keep the door balanced. Highly flammable paint finishes are to be avoided.

2.6 Smoke Control Doors

In certain situations smoke control doors are required e.g. in corridors longer than 30m in hostels. Such doors need not be fire resisting and need not conform to the requirements of this section other than those requrements relating to smoke sealing (paragraphs 2.5.10. · 2.5.3. · 2.5.6. & 2.5.11). These doors are refered to as FD20S doors.

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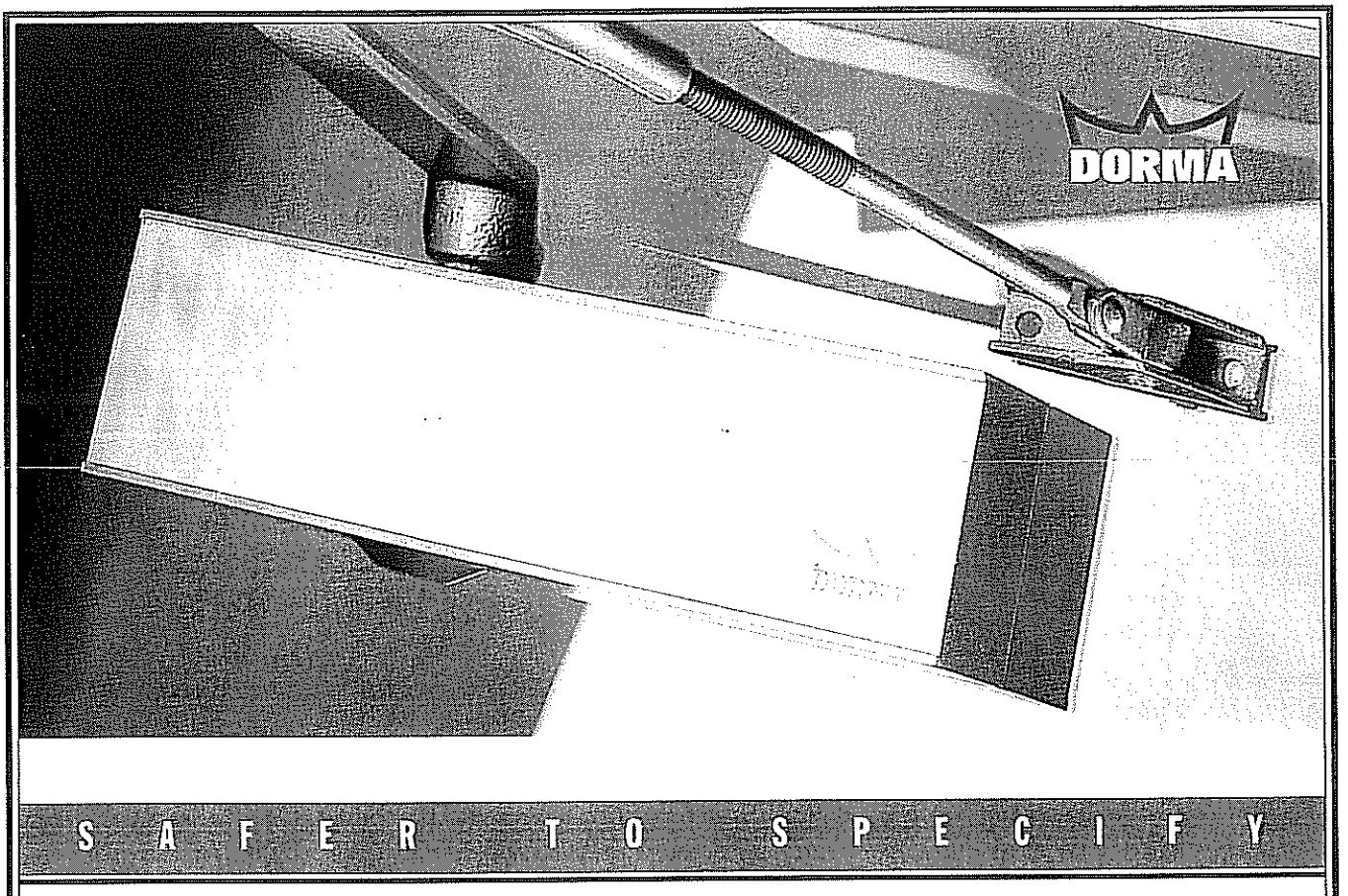

S A F E R T O S P E C I F Y

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The company leads the way in fire resisting doors which all meet the performance requirements of relevant British Standards.

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Telephone: (Freephone) 0800 591202

Head Office: John Carr Sales,
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Doncaster
South Yorkshire,
DN5 9LR

Telephone: 01302 783333

Facsimile: 01302 787383

E-Mail: sales@johncarr.co.uk

Internet: www..johncarr.co.uk

DOOR HARDWARE

1.0 INTRODUCTION

The current ***HMO Code of Practice*** makes little mention of door hardware except to say that all fire doors, except those to cupboards (and lift wells), should be fitted with self-closing devices which will ensure positive latching of the door. It is imperative that hardware items which permit a door leaf to perform its functions have no effect on its potential fire performance.

1.1 Currently, there are no fire test procedures for ironmongery in isolation and all the fire tests, to BS 476 : Part 8 : 1972 or Part 22 : 1987, are for doorsets which include **"Essential"** ironmongery.

1.2 **"Essential"** ironmongery is defined in BS 8214 : 1990 as those items that are vital to achieve fire resistance performance of a fire door assembly. This ironmongery is required to:

- Hang the door within the frame using a hinge or pivot.
- Allow the door to be opened and closed from both sides and retain it in a closed position either by use of a latch or self closing device.

1.3 **"Non-essential"** ironmongery is defined in BS 8214 : 1990 as those items which are not required to achieve the fire resistance performance of a fire door assembly but which if fitted may affect the performance.

1.4 The failure of a doorset to achieve a satisfactory level of fire resistance may be due to a failure at the point of fixing for the ironmongery. It is therefore essential to use suitable ironmongery proven by testing on a door of the same construction, size and configuration..

Although a fire test report is only valid for a specific door and frame construction, it is permissible to "assess" the possible alternatives of ironmongery. BS 8214 : 1990 clause 3, amendment 1, states that such ***assessments*** should be carried out by a "Competent Assessor" .

1.5 Products which have "Certifire" third party product approval may be assumed to comply with all fire resistance requirements provided they are fitted in accordance with the manufacturers instructions and installed within the defined ***"Field of Application"***. The "Field of Application" takes the form of a certificate issued by "Certifire" and cover such items as :

- Whether the door hardware is suitable for 30 or 60 minute doors
- Whether it can be used on latched, unlatched or both types of doorsets (door and frame assembly)
- The maximum width and height of the door to which it can be fitted.
- The minimum and maximum thickness of the door to which it can be fitted.

1.6 Much of the information given in this section can be obtained from the Association of Builders Hardware Manufacturers (ABHM) Code of Practice "Hardware essential to the optimum performance of fire-resisting timber doorsets" published in July 1993, and The Guild of Architectural Ironmongers (GAI) Code of Practice for Architectural Ironmongery suitable for use on Fire Resisting Self Closing Timber and Emergency Exit Doors published in September 1993.

2.0 HINGES

2.1 Hinges should be selected to perform in accordance with BS 7352 : 1990 : Clauses 4-6.

This section will only illustrate ***Knuckle type Butt hinges*** and ***Rising Butt type hinges.***

For types other than the above reference should be made to the Association of Builders Hardware Manufacturers (ABHM) Code of Practice, The Guild of Architectural Ironmongers (GAI) Code of Practice or Door Manufacturer's Technical Services departments.

2.2 Hinge specification and fixing position, Screw details

Hinges fitted to fire resisting doors should be non-combustible with a melting point not less than 800°C, at least 100mm long and with a width to suit the thickness of the door. Generally they will be approximately 75mm wide.

Steel hinges and screws are acceptable. Brass hinges and screws can only be accepted where their melting point exceeds 800°C.

It is recommended that all fire doors should be hung on a minimum of 3 hinges in accordance with DDI 171 : 1987. Four hinges may be required for very heavy, tall or wide doors. There has been much debate as to where the 3rd hinge should be fitted, either in the top third of the door leaf or at the mid point. Technically it should be fitted in the position as stated in the fire test report for the door assembly. However, as this report will not usually be available it is acceptable to fit the third hinge in either position

- For 30 minute fire resisting door leaves of 44mm thickness, no part of the hinge should extend across the door thickness to a position closer than 12mm from the non-pivoting face. (Figure 4.1)

- For 60 minute fire resisting door leaves of 54mm thickness no part of the hinge should extend across the door thickness to a position closer than 18mm from the non-pivoting face. (Figure 4.1)

Where a door of reduced thickness is to be used advice should be sought from the door manufacturer.

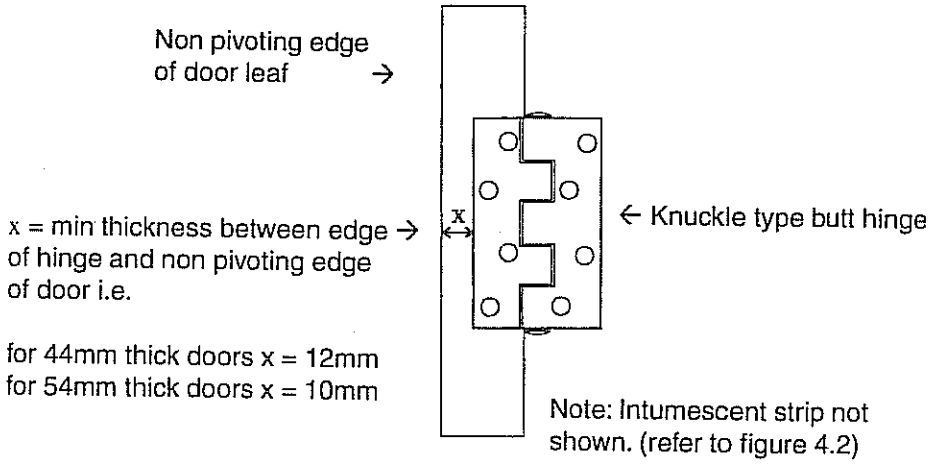


Figure 4.1 - Fixing position of Knuckle -butt type hinge

Screws not less than 38mm long and 3.8mm in diameter (No 8) should be used. They should have melting point not less than 800°C.

2.3 Intumescent Strip details

- For 30 minute fire resisting doors it is usual to fit a single 10mm wide intumescent strip which may be interrupted by the hinges.(Figure 4.2)

- For 60 minute fire resisting doors a single 20mm wide intumescent strip or two 10mm wide strips may be used. At least 10mm of the strip must be uninterrupted by the hinges. (Figure 4.2)

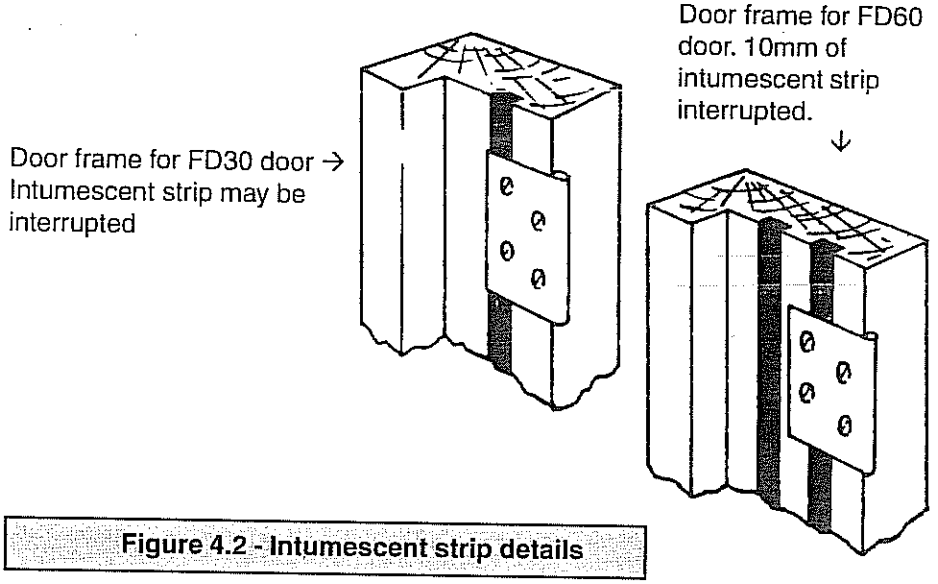


Figure 4.2 - Intumescent strip details

2.4 Rising Butt type hinges

Rising butt hinges must **not** be used on fire resisting doors because :

- There will be a gap in excess of 4mm at the head of the door due to the action of the hinge. This will defeat the smoke seal and lower the effectiveness of the intumescent strip (Section 3 - Fire resisting doors)

- They are unsuitable as self closing devices complying with latching requirements.
- BS 8214 : 1990 and BS 7352 : 1990 draw attention to their inability to perform adequately as self closing devices in accordance with Regulatory Requirements.

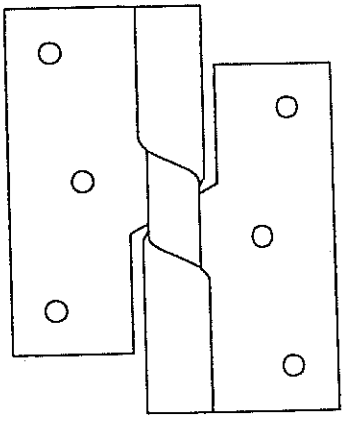


Figure 4.3 - Rising Butt Hinge (Not permitted)

3.0 DOOR CLOSERS

3.1 In the event of fire it is essential that a fire resisting door is closed and secured within its frame to provide an effective fire barrier. This can be achieved by a mortice lock or latch or a door closing device. A lock or latch should be used in most cases, however in certain circumstances e.g. corridor doors a lock/latch may not be suitable and the door must be held in place by the closing device.

BS 5588: Part 1 Clause 18.b.2(c) makes the following recommendations for door closing devices :

- They should not be capable of being disconnected easily.
- They should override any latches or seals fitted to the doors
- They should be of a type that has been shown by fire test, in accordance with BS 476: Part 22 : 1987 (or Part 8 subsequent to 1981), to be capable of holding the door into the frame until the intumescent strip has been activated.

They should effectively close the door from any angle

It is also vital that the closer is correctly selected and properly fitted in order that the whole fire door assembly may properly perform its full function.

Fire door closers are required to perform one of two functions as set out in paragraphs 3.1.1 & 3.1.2

3.1.1 Latched Doors

Where the door is fitted with a latch the closer is simply required to return the door into the frame in a controlled manner and engage the latch bolt. The latch will then hold the door in place.
In order to overcome the resistance of the latch bolt the closer mechanism can be provided with a "snap/latch" facility. This speeds up the last few degrees of the closing cycle. Many closers are available with this "snap action" operation built into them, and in the majority the speed of the "snap" is adjustable.

3.1.2 Unlatched Doors

Where no latch is fitted the closer must hold the door in position until the intumescent seal is activated which will then take over that function

Unlatched doorsets are not acceptable except in cupboard doors which must be kept locked shut or ***smoke stop doors*** across corridors

A door should be easy to open, particularly where the premises are occupied by young or elderly people and some people with disabilities.

The following types of closer will be encountered :

- Face Fixed Overhead Closers (3.2)
- Face Fixed Jamb Closers (3.3)
- Concealed Overhead Closers - Door mounted (3.4)
- Concealed Jamb Closers (3.5)
- Dictator Door Check (3.6)
- Floor Springs (3.7)
- Coiled "Gate" Springs (3.8)
- Spring Hinges (3.9)

3.2 Face Fixed Overhead Closers

A product of proven mechanical performance and durability to BS 6459: Part 1: 1984 should be selected. (This standard will shortly be replaced by a new European standard EN 1154 which covers controlled closing devices).

These can be fitted on the pull face (Figure 4.4), mounted on the transom on the push side of the door (Figure 4.5) or push face (Figure 4.6),

Where possible they should be on the face least likely to be exposed to fire.

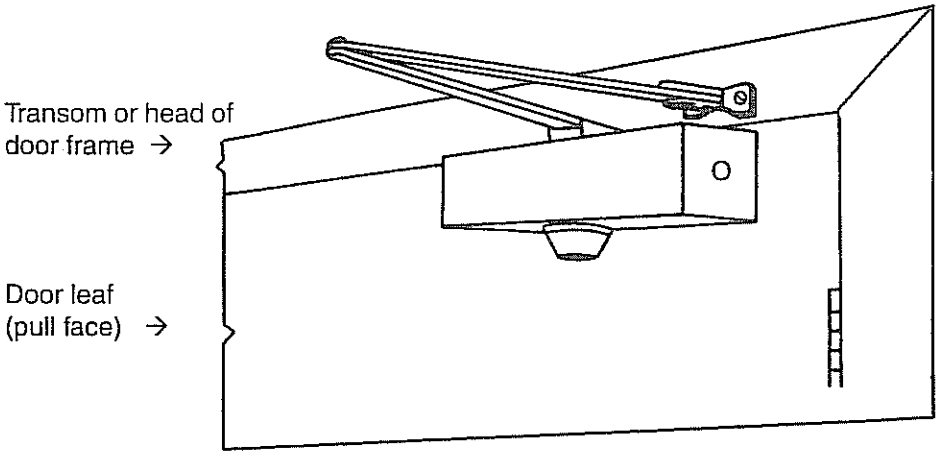


Figure 4.4 - Face Fixed Overhead Closer mounted on pull face of door

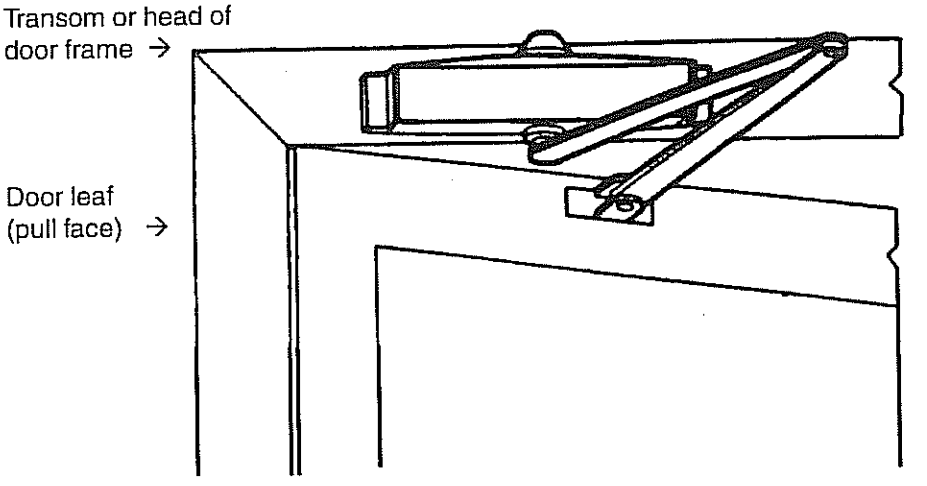


Figure 4.5 - Face fixed overhead closer mounted on the transom with the arm bracket fitted to the push face of the door

"*Application 66*" is where the closer is fixed on the push face in such a way that the arms are parallel to the door face (Figure 4.6).

This method of fitting is normally used where the structural detail precludes the use of the closer mounted on the pull face, and provides a neater arm appearance than with transom mounted models.
However, this application reduces the effective power of the closer and therefore it is advisable that the power size of the closer is increased

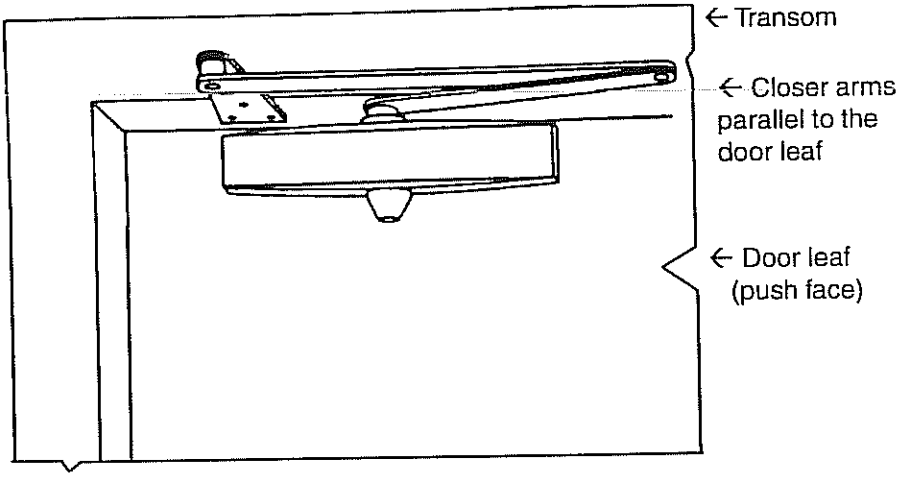


Figure 4.6 - Face fixed overhead closer showing "Application 66" method of fixing

Face Fixed Overhead closers are very effective devices for closing doors. However, in some circumstances it can be difficult for the elderly, young and disabled to open such doors, especially if the power of the closer is not matched to the door conditions.

A number of solutions can be applied to minimise these problems :

- Latches and seals with low friction can be chosen to reduce the amount of closing force required. This in turn will reduce the opening force required from the user
- Certain overhead closers can be adjusted for power after installation, to permit the minimum power, necessary to overcome wind conditions or latchbolt friction, to be set
- In many situations an electrically controlled "Free-Swing" door closer can be installed which has the advantage of removing all closing force during normal operation, releasing the closer mechanism only in the case of a fire alarm condition. Such devices are more expensive than simple door closers and are linked to the automatic fire detection system. (paragraph 5.4)
- Power assisted overhead closers can be fitted. These can be fitted on the "push" or "pull" side and are designed to operate such that power assistance is provided immediately the door is pushed or pulled. They require connection to a suitable electrical supply.

Where there is a likelihood of vandalism and/or a more aesthetically pleasing closer is required, slide arm closers are available as an alternative to the projecting arm closers shown in Figures 4.4 and 4.5. These closers are more attractive in appearance and several models are as easy to open as projecting arm closers. They can usually be mounted on either the "pull" or "push" side of the door or frame. They are generally more expensive than projecting arm closers.

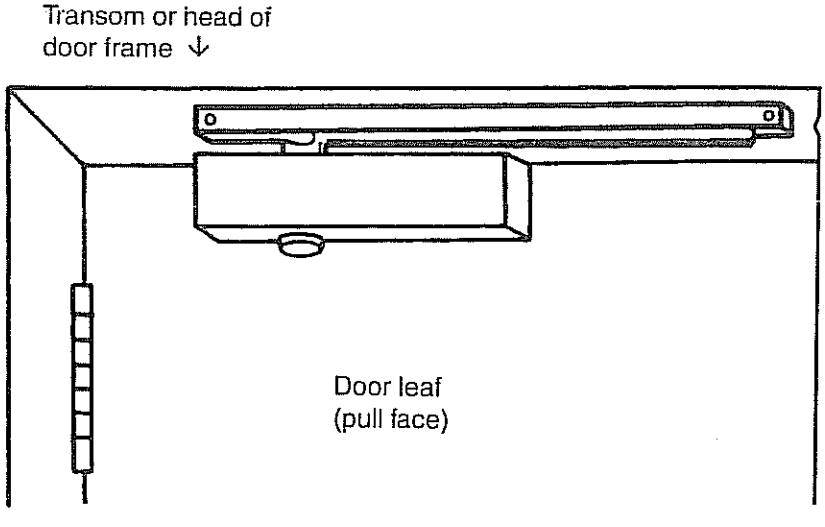


Figure 4.7 - Slide arm overhead type closer

3.3 Face Fixed Jamb Closers ("Gibraltar")

These closers should not be used as they are easily immobilised. They are also unlikely to have sufficient force to close the door and do not control the door's closing speed.

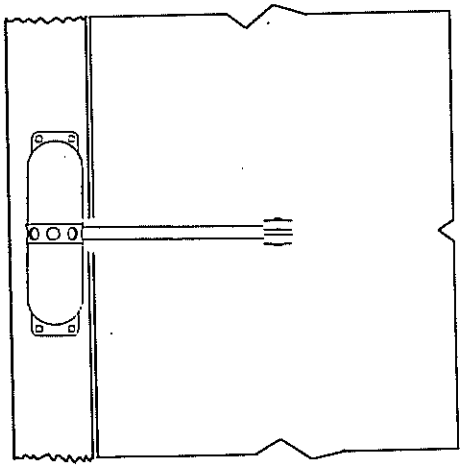


Figure 4.8 - "Gibraltar" type face fixed jamb closer

3.4 Door Mounted Concealed Overhead Closers

These require the removal of a large section from the head of the door and are therefore not acceptable unless proven by fire tests usually involving a 54mm door.

The closer, with its special intumescent gasket, must be accurately fitted in accordance with the conditions set out in the fire test report without leaving voids in the construction.

It is recommended that these are supplied as a factory fitted product

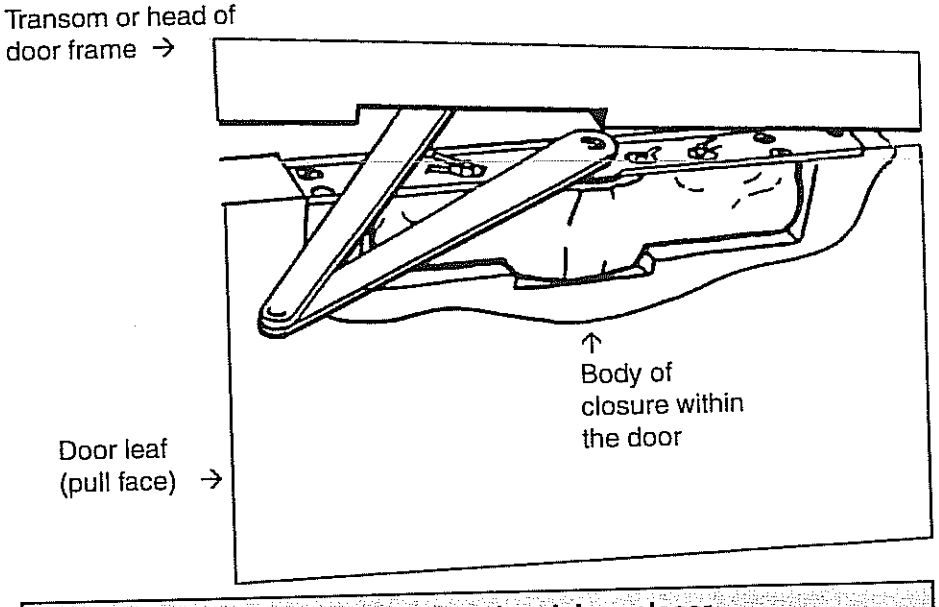


Figure 4.9 - Concealed overhead door closer

3.5 Concealed Jamb Closers

3.5.1 Single chain spring closers - non check

These are commonly called "*perkos,*" (Figure 4.10). They should be discouraged as they do not control the closing speed and are not provided with a "snap action" facility. Therefore, they may not overcome the resistance of the latch bolt from low angles. Further, as they have limited strength in the closed position, they are unlikely to hold an unlatched door in place for the required period prior to the intumescent seal being activated.

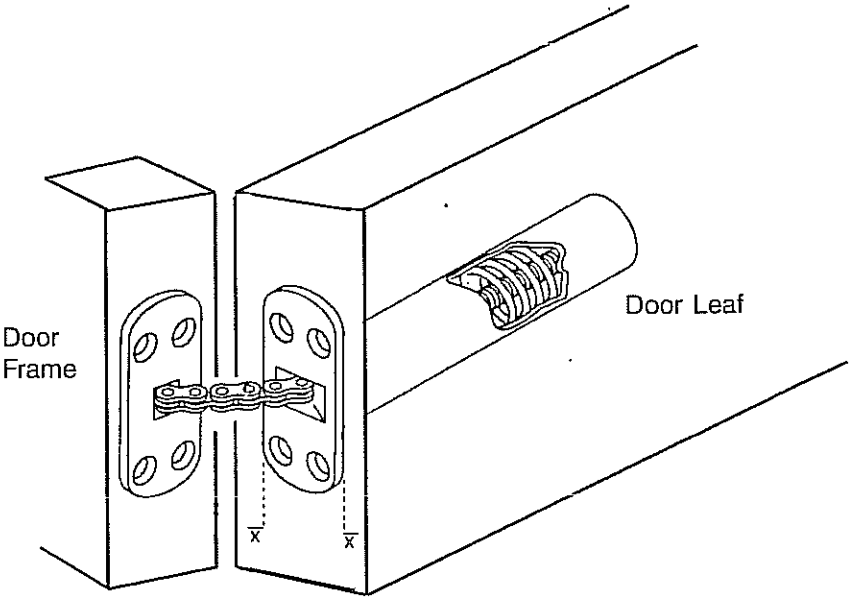
They may be combined with a "***Dictator***" unit (paragraph 3.6) which provides the "snap action" facility and will provide sufficient strength in order that the resistance of the latch bolt is overcome.

A hole must also be bored into the body of the door that may affect its integrity. In order to mitigate against this, a minimum thickness of wood must be left either side of the device which is :

- For 30 minute fire resisting doors, (FD30) there should be at least 10mm of softwood (7.5mm of hardwood) either side of the mechanism. (Figure 4.10)

- For 60 minute fire resisting doors, (FD60) there should be at least 19mm of softwood (15mm of hardwood) either side of the mechanism. (Figure 4.10)

Care must be taken to avoid over-morticing. Where this occurs the void should be filled with intumescent paste or mastic.



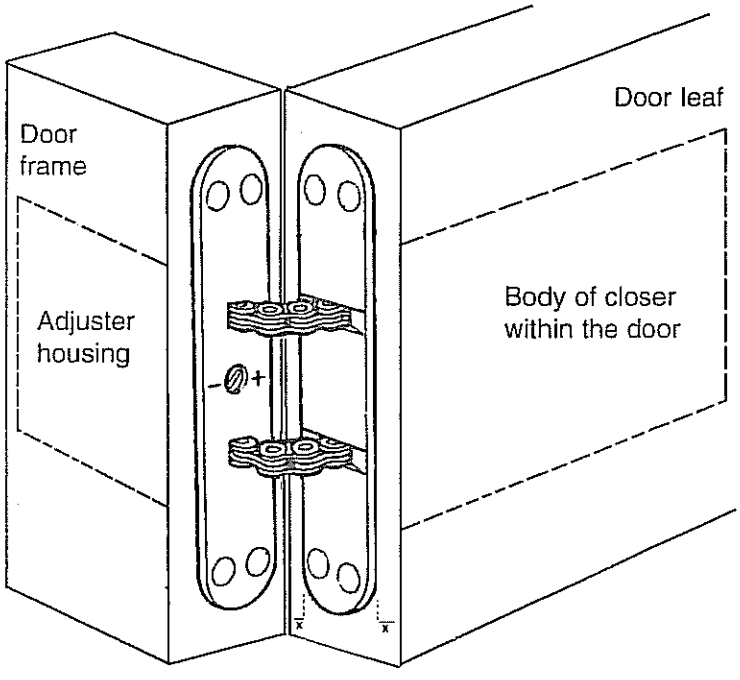
x = the minimum thickness of wood i.e.
For FD30 doors x = 10mm of softwood (7.5mm of hardwood)
For FD60 doors x = 19mm of softwood (15mm of hardwood)

Figure 4.10 - Single chain concealed jamb closer ("Perko")

3.5.2 Double Chain Spring closers - hydraulic closer

These are commonly called "double chain *perkos*" (Figure 4.11). These are hydraulically controlled which overcomes some of the problems of the closing ability of the single chain type. However, they do not fully control the closing speed.

The same minimum thicknesses of wood must be left either side of the device as detailed above for single chain "Perkos". As the width of the face plate of this closer is approximately 25mm it should not be fitted to any softwood doors less than 45mm thick.



x = the minimum thickness of wood i.e.
For FD30 doors x = 10mm of softwood (7.5mm of hardwood)
For FD60 doors x = 19mm of softwood (15mm of hardwood)

Figure 4.11 - Double chain concealed jamb closer

3.6 Dictator Door check

This device CANNOT be used on its own as it will not close the door. It is designed to shut the door as it nears the closed position.

A built in damper stops the door from slamming and the door is drawn shut by the in-built spring.

This device may be used with a "perko" as it overcomes some of the limitations of that device (paragraph 3.5)

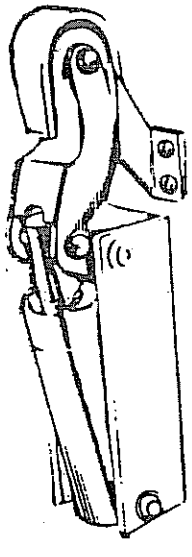


Figure 4.12 - Dictator Door check

3.7 Floor Springs - Double or Single action

This type of closer is suitable for use on fire resisting doors and has been proved in fire tests. The spring and check mechanism is housed in the floor and therefore is not, to any significant extent, affected by fire. These can be provided to fit onto single action doors (i.e. open one way) or double action doors (i.e. open both ways). The design of the "strap" or "shoe" which is the fitting provided at the foot of the door will depend on whether it is to be fitted on to a single or double action door. These often need significant additional intumescent protection, and unless fire test evidence is available the pivot bearing should not incorporate low melting materials which may allow the door to move during heating.

3.7.1 Bottom Strap Mounted

These consist of a steel lever incorporating a tapered socket which fits onto the projecting drive spindle of the door closing device. The strap is installed centrally within the thickness of the bottom rail and is largely concealed. It is therefore highly successful in use as it is placed in the negative pressure fire condition. A single action strap is illustrated in (Figure 4.13)

3.7.2 Bottom Shoe Mounted

In this case the fitting is not installed centrally within the door but is around the heel of the door. Although this is placed in the negative pressure fire condition it can cause integrity failure due to heat transfer . This type of fitting should not be used in double action doors as the metal wraps round both sides of the heel of the door. A single action shoe is illustrated in (Figure 4.13)

3.7.3 Top Centre

The equivalent fitting for the head of the door is called a "Top Centre", its design is dependent on whether it is to be provided for single or double action door. A single action top centre is illustrated in (Figure 4.13)

1. Plain top centre position.
2. Covers for top centre knuckles
3. Bottom Strap.
4. Cover for bottom strap knuckle.
5. Shoe alternative to bottom strap.
6. Floor spring top or cover plate.
7. Floor spring pivot cover.
8. Floor spring unit (mechanism).
9. Floor spring loose box or foundation box.

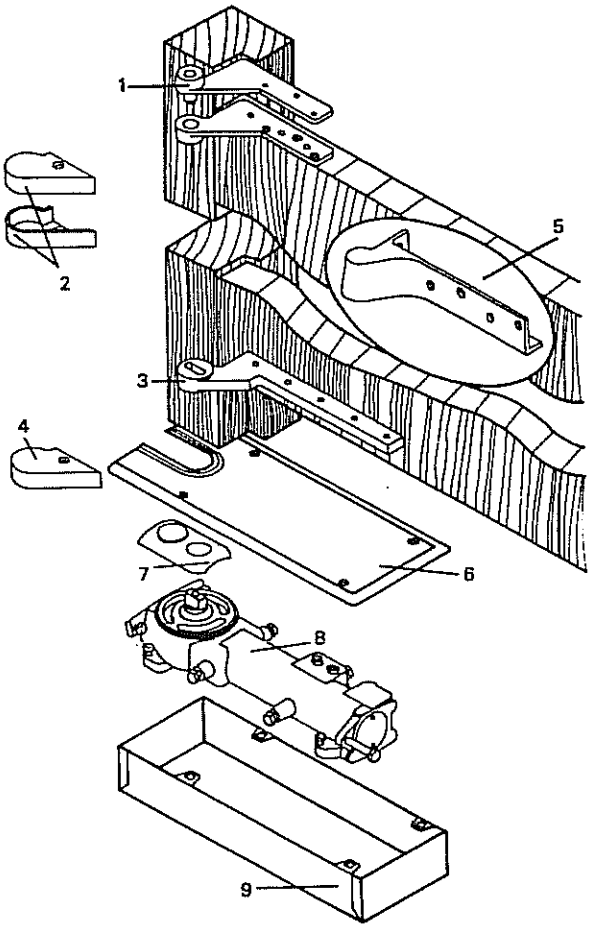


Figure 4.13 -Typical single action floor spring component arrangement showing the alternative bottom strap or shoe fitting

3.8 Coiled "Gate" Springs

These are not acceptable and, if fitted, must be replaced.

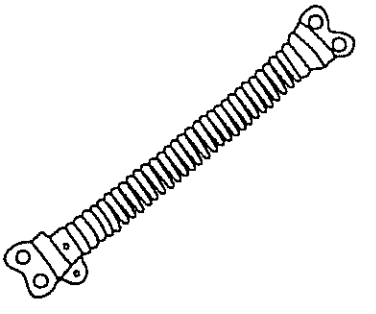


Figure 4.14 - Coiled gate spring

3.9 Spring Hinges

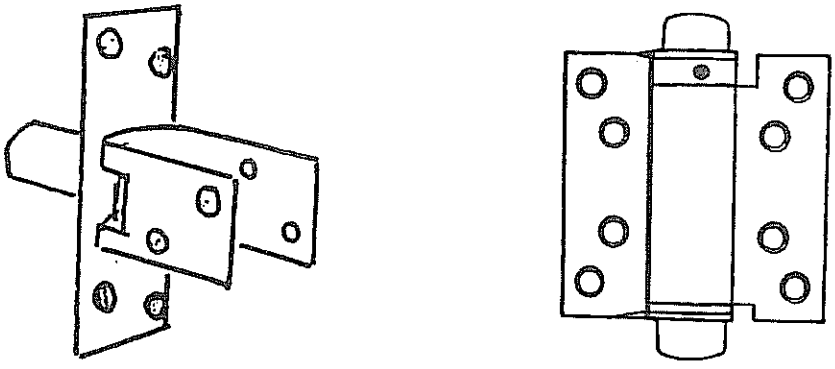


Figure 4.15 -Illustrates two types of spring hinges :
On the left is the "Hawgoods" pattern for fitting onto "double action" doors.
On the right is a spring hinge for fitting onto "single action" doors
(a similar "double action" type is also available).

These should not be accepted.

- They are unlikely to overcome the latch resistance from low angles (20^0 or less).
- They also do not control the closing rate of the door.

4.0 LOCKS AND LATCHES

4.1 To provide an effective barrier to fire, a door must remain firmly closed in its frame. This role is frequently undertaken by a latch.

A lock or latch fitted to a fire resisting door should meet the performance specifications laid down in BS 5872 : 1980.

Doors leading to escape routes should be fitted with simple fastenings that can be readily operated from the side approached by people making an escape. The operation of these fastenings should be without the use of a key.

Holes in doors to accommodate keys and spindles should be kept to a minimum. Where a door has been over-morticed it should be tightly packed with intumescent paste or mastic and installed so as not to gum up the mechanism..

The following types of locks and latches will be encountered :

- Roller/Ball Catches (4.2)
- Mortice Latches, Combined Lock and Latch devices and Mortice Night Latches (4.3)
- Mortice Deadlocks (4.4)
- Cylinder Rim Locks (4.5)
- Bored in Knobsets (4.6)
- Door Bolts (4.7)

4.2 Roller/Ball Catches

These cannot be relied upon to retain the door in the closed position therefore should not be used be used on fire resisting doors.

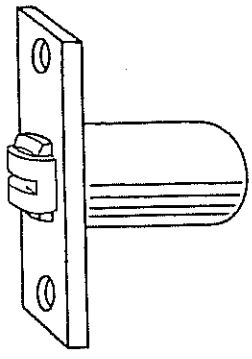


Figure 4.16 - Roller Catches/ Ball Catches

4.3 Mortice Latches, Combined Lock and Latch devices and Mortice Night Latches

Only devices that comply with the mechanical performance of BS 5872 : 1980 should be used on fire doors.

Note : BS 5872 : 1980 is shortly to be replaced by BS EN 12209.

A hole must be morticed into the body of the door that may affect its integrity. It is therefore essential to strictly adhere to fire test reports, where the assembly including the hardware is identical to that tested, otherwise an **assessment** or ***field of application report*** issued by a ***suitably qualified person*** must be followed. Further detailed guidance can be obtained in both the ABHM and GAI Codes of Practice. However, the following minimum thickness of wood around the latch/lock case may be taken as a guide:

- **For softwood FD30 doors** - At least 10mm of wood should remain either side of the body of the mechanism
- **For hardwood FD30 doors** -These types of doors are not common and reference should be made to the fire test report, assessment or field of application report
- **For softwood FD60 doors** - At least 20mm of wood should remain either side of the body of the mechanism
- **For hardwood FD60 doors** - At least 17mm of wood should remain either side of the body of the mechanism

It is important to note that the face plate of the lock/latch is wider than its body and it is the thickness of the wood around the body of the lock/latch that is critical.

In addition, if the door incorporates a non-combustible insulation board immediately beneath the door facings, it may be possible to reduce the thickness of the wood provided the non-combustible board is not cut away.

The latch bolt must be manufactured from steel or brass for both 30 and 60 minute fire resisting doors.

The door handles should preferably be of low melting point material to prevent transfer of heat.

Where locks are provided it is important that they can be operated from the room without the use of a key e.g. a "thumb turn". (Figure 4.18).

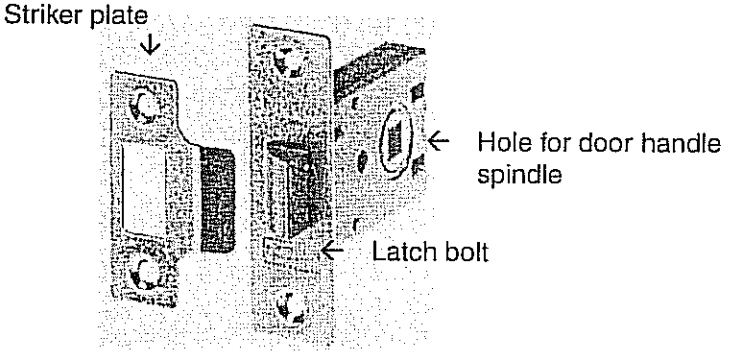
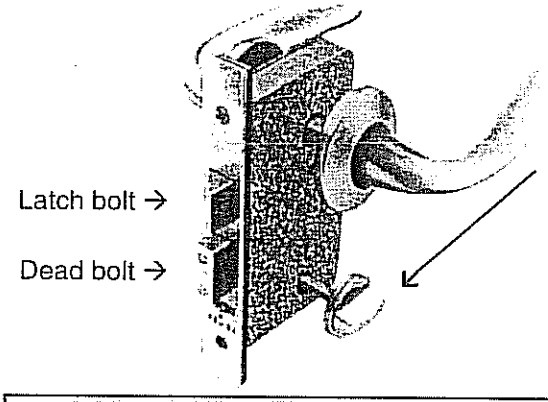


Figure 4.17 - Mortice latch



Note the 'thumb turn' operated lock. The turn should be sited on the room side of the door to facilitate escape without the use of a key.

Figure 4.18 -Combined lock and latch unit

An **escape lock** is a variation of the combined lock and latch device shown above. In this case both the latchbolt and dead bolt are withdrawn simultaneously by depressing the inside handle.

Mortice Night Latches can be used in place of a ***Cylinder Rim Night Latch*** (see paragraph 4.5). Because it is morticed into the door it is protected from the full effects of the fire by the timber.

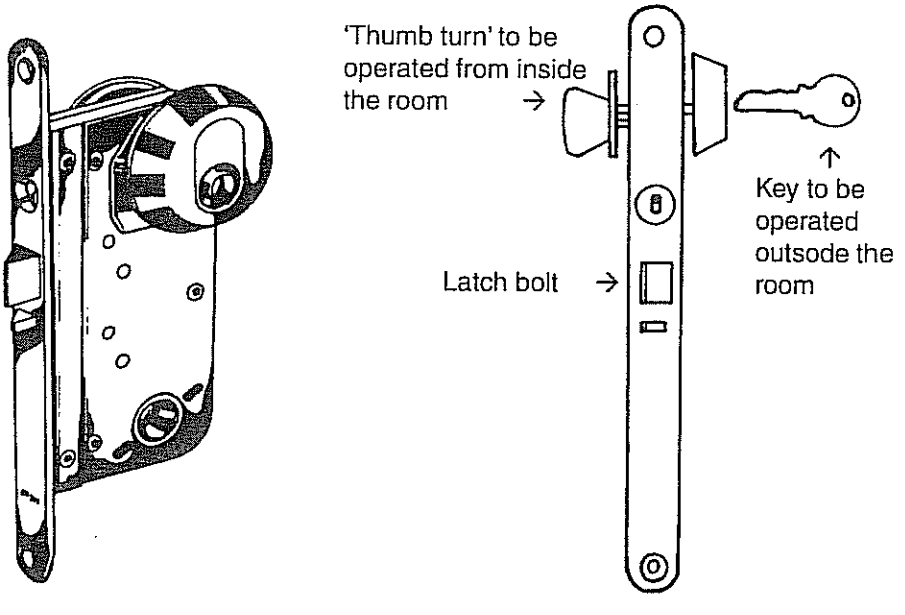


Figure 4.19 - Mortice Nightlatch

4.4 Mortice Deadlocks

Only devices that comply with the mechanical performance of BS 5872 : 1980 should be used on fire doors.

Note : BS 5872 : 1980 is shortly to be replaced by BS EN 12209.

A hole must be morticed into the body of the door that may affect its integrity. It is therefore essential to strictly adhere to fire test reports, where the assembly including the hardware is identical to that tested, otherwise an **assessment** or ***field of application report*** issued by a ***suitably qualified person*** must be followed. Further detailed guidance can be obtained in both the ABHM and GAI Codes of Practice. However, the following minimum thickness of wood around the lock case may be taken as a guide:

- **For softwood FD30 doors** - At least 10mm of wood should remain either side of the body of the mechanism
- **For hardwood FD30 doors** -These types of doors are not common and reference should be made to the fire test report, assessment or field of application report
- **For softwood FD60 doors** - At least 20mm of wood should remain either side of the body of the mechanism
- **For hardwood FD60 doors** - At least 17mm of wood should remain either side of the body of the mechanism

It is important to note that the face plate of the lock is wider than its body and it is the thickness of the wood around the body of the lock/latch that is critical.

In addition, if the door incorporates a non-combustible insulation board immediately beneath the door facings, it may be possible to reduce the thickness of the wood provided the non-combustible board is not cut away.

The dead (unsprung) bolt must never be considered as a retaining device as without a sprung latch it becomes an unlatched doorset (Closers - paragraph 3.0). It should therefore only be fitted to cupboard doors unless it is fitted in combination with a separate latching device e.g. mortice latch or cylinder rim night latch.

Note : If it is fitted on room doors (with a separate latching device) it must be provided with a "thumb turn" (Figure 4.18) or similar device and not be key operated

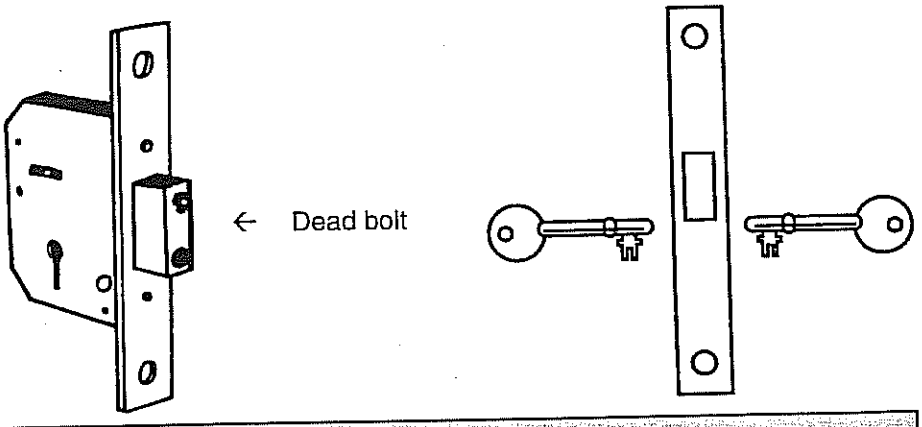


Figure 4.20 - Mortice Deadlock

4.5 Cylinder Rim Night Latch

Commonly known as "Yale" locks although they are manufactured by a number of different companies

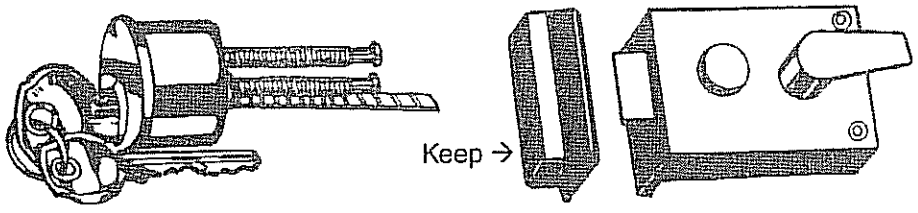


Figure 4.21 - Cylinder Rim Night Latch

The installation of the rim latch cylinder through the door leaf requires a hole of approximately 32mm diameter. To maintain the integrity of the door it is necessary to fill the hole with intumescent paste.

4.6 Bored in Knobsets

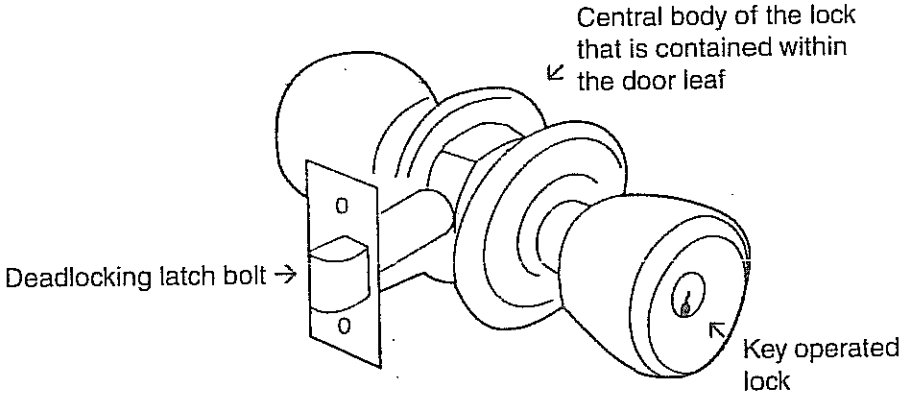


Figure 4.22 - Bored in knobset

These require a large section of the door to be removed and should not be accepted unless accompanied and fitted in accordance with a fire test report appropriate to the type of door being used.

4.7 Door Bolts

These should be discouraged unless properly fitted. They can be difficult to operate and cause delay and therefore hinder escape.

They may be used in double leaf doorsets. Advice on their use is to be found in either the ABHM or GAI Codes of Practice.

5.0 OTHER TYPES OF DOOR FURNITURE

5.1 Letterplates

These should be avoided wherever possible because cutting a hole of suitable size through the door can affect the door's stability and integrity. However a number of manufacturers have successfully submitted their products to BS 476 : Part 22 : 1987 tests.

Before agreeing to the installation of a letterplate in a fire resisting door, officers should ensure that the proposed letterplate has been included in a door which has been successfully tested to BS 476 : Part 22 : 1987 with a door of similar construction. The recommendations contained in that test report must be strictly followed

In general, the following factors must be considered:

- Is the door suitable?
- Where should the letterplate be positioned?
- Which type of letterplate should be fitted?

The installation of a letterplate is normally restricted to doors that are at least 44mm thick. Furthermore, letterplates should not be fitted to doors with low density cores unless special liners are used.

It is recommended that the letterplate should not be sited higher than 1000mm from the threshold of the door and not less than 120mm from either edge of the door leaf.

BS 2911 : 1974 (1980) Specification of Letterplates should be followed. This states that the maximum size of the aperture should not exceed 250mm x 40mm. The aperture created for the letterplate should, wherever possible, give a contact fit with the sides of the liner. Where the gap is greater than 1mm it should be filled with an intumescent material.

5.2 Door Viewers (also known as spy holes)

The materials from which door viewers are constructed will affect the integrity of the door.

The product should have been included in a satisfactory fire test and the report obtained alternatively an ***assessment*** or ***field of application report*** issued by a ***suitably qualified person*** must be relied upon.

Plastic lens or casings together with casings of low melting points should be avoided as they may melt quickly leading to early integrity failure. However, substantial steel or brass casings may also increase the risk of early integrity failure by rapid heat transfer.

It is therefore, essential that the hole cut through the door should be as small as practically possible. As a guide the maximum width of the hole should be 12mm. However larger viewers, provided they are constructed in accordance with the above guidence **and** a satisfactory fire test report, ***assesment*** or ***field of application report*** is obtained, may be acceptable.

5.3 Electro-Magnetic Door Holders

Electro-magnetic door holders are only permitted where the doors do not enclose a single escape stairway and provided they are linked to the fire alarm/detection system. (Building Regulations 1991, Approved Document B, Appendix B).

They have the advantage of eliminating the practice of wedging or propping fire doors open

Mechanisms that are required to be released manually are not permitted in any circumstances.

5.3.1 Conditions of Acceptance

The LFCDA have issued a guidance note (Number 48) that covers this subject and the conditions of acceptance have been taken from this note.

- Only automatic release mechanisms (door holders) that comply with BS 5839 : Part 3 should be used. Note : Electro-magnetic door holders which are integral with the door closer are also available. These devices do not come within the remit of BS 5839 : Part 3 and are permitted.

- The automatic release device is to react upon the door on the same horizontal plane as that of the door closer and be positioned near the leading edge of the door leaf.

- The door closer is to close the door at a safe controlled speed and must be hydraulically controlled.

- Each door holder is to have a holding force not exceeding 11 Kg to permit the door to be readily closed by hand. (refer to manufacturers specification)

- A local system of smoke detection equipment is to be provided on both sides of the door, to ensure the early detection of smoke. The installation of a fully automatic fire detection system within the premises to comply with BS 5839 : Part 1 : 1988 for an L2 type system or BS 5839 : Part 6 : 1995 for a Grade A system will meet this requirement.

- The smoke detectors are to be connected with their respective door holder and the electrical fire alarm system in such a way that the holders are rendered inoperative on the actuation of the detector or the electrical fire alarm system such that the door closes

- Any door fitted with a hold open device must close automatically upon the occurrence of any of the following:-

  a) Detection of the smoke/fire by the alarm system

  b) Manual operation of a switch fitted in a suitable position adjacent to the device.

  c) Failure of the electricity supply to the device.

  d) Manual operation of the fire alarm.

- In premises where there is a sleeping risk (i.e. HMOs), all doors fitted with electro-magnetic door holders must be closed at night. This requirement could be achieved by use of a time clock installed in the electrical circuit and set to automatically close all such doors at a specified time.

- A conspicuous notice in plain letters of 5mm height is to be provided on each door fitted with a door holder and be readily visible when the door is held open . The notice should read either "Automatic fire door keep clear" or if the premises has a sleeping risk "Automatic fire door keep clear. Close at night". (Section 12 - Signs and Notices)

- A test switch is to be provided to simulate the operation of the alarm system. Some devices are constructed with integral test switches.

- Each door should be checked to ensure its correct operation each time the fire alarm is tested and be maintained by a ***Competent Person*** at intervals not exceeding 6 months.

5.4 Free-Swing Overhead Closing Devices

These devices are surface mounted electrically controlled overhead door closer units that are specifically designed to automatically close a door upon actuation of a fire alarm system but to leave it free- swinging, i.e. the door remains open unless manually closed, at all other times.

It must be a "fail safe" unit which closes the door when:

- The alarm is activated either manually or by smoke or heat detectors operating a break switch to interrupt the circuit to the electro-magnet

- There is a power failure or any other interruption of the electro-magnet power supply.

Note: Power for these devices must not be drawn from the alarm system except under alarm conditions (BS 5839 : Part 1 : 1988)

A test switch is to be provided to simulate the operation of the alarm system

Each door should be checked to ensure its correct operation each time the fire alarm is tested and be maintained by a ***Competent Person*** at intervals not exceeding 6 months.

These closers can be provided for room doors. However they are not only expensive to install but they also rely on the automatic fire detection system to operate and therefore they should only be used in exceptional circumstances e.g. in areas occupied by elderly or disabled people.

5.5 Emergency Exit Hardware

Exit devices are divided into two categories

- Panic exit devices
  These devices are designed for people who are not aware of the locking arrangements

- Emergency exit devices
  These devices are for use in situations where people are familiar with the locking arrangements (commonly termed as "trained traffic")

All exit devices must fulfil two functions

- To provide security against unauthorised access from the outside
- To allow the door to be opened quickly from the inside

The most common devices complying with these requirements are panic latches and panic bolts although break glass bolts can be used. Other types of equipment are available but they will not be considered in this document, reference should be made to the Guild of Architectural Ironmongery Code of Practice.

5.5.1 Panic Bolts and Panic Latches

A horizontal bar extends across the inside face of the door. When it is depressed by hand or body pressure from any position it operates the bolt mechanism which allows escape.

They should be designed, manufactured and tested to meet, or exceed the requirements of BS 5725 : Part 1 : 1981 - Emergency Exit Devices - Specification for panic bolts and panic latches mechanically operated by a horizontal push - bar.

If the door to which the device is to be fitted is required to be a fire resistant door it is important to ensure that the Panic Bolt or Latch and door have been satisfactorily tested or assessed to BS 476 : Part 22 : 1987.

Note: Panic devices are normally fitted to final exit doors which do not have to be fire resistant.

The bar should be installed at a height of between 900mm and 1100mm from the finished floor level. (BS 5725, Appendix B)

Maintenance checks should be carried out at intervals of not more than one week by the occupier or his approved representative. These are to include a check to determine that the bolt or bar is in proper working order and is lubricated according to manufacturers instructions. (BS 5725, Appendix C)

A sign which reads "Push Bar to Open" and complying with BS 5499 : Part 1 : 1990 should be provided on the inside face of the door immediately above the push bar or on the push bar if it presents sufficient flat face to take the size of lettering required. BS 5499 states that preferred letter height should be 15mm. (BS 5725, Appendix D) 1990 (Section 12 - Signs and Notices)

Panic Bolts

These can be fitted to single leaf or double leaf doors

Depressing the horizontal bar causes the top and bottom shoots to withdraw from their sockets in the transom and floor.

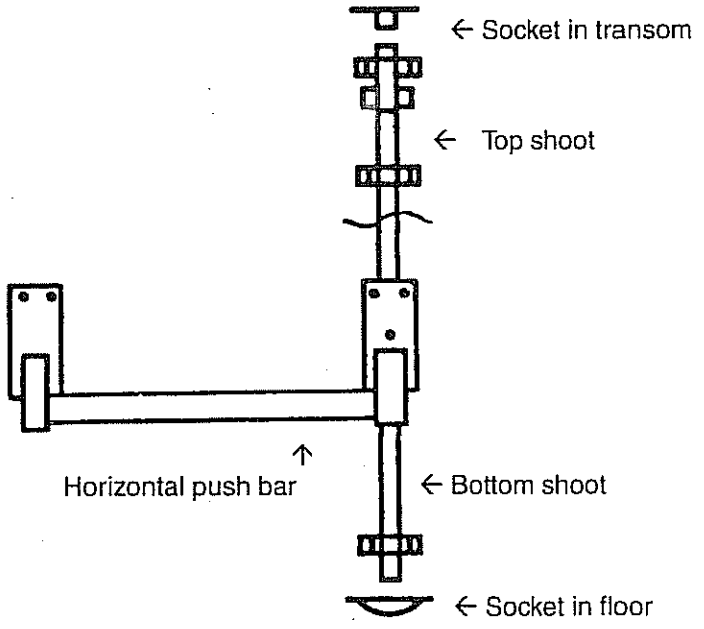


Figure 4.23 - Panic Bolt - fitted to a single leaf door

Panic Latches

These are suitable for single leaf doors or in combination with a panic bolt on double leaf doors . Depressing the horizontal push bar causes the withdrawal of the latch bolt.

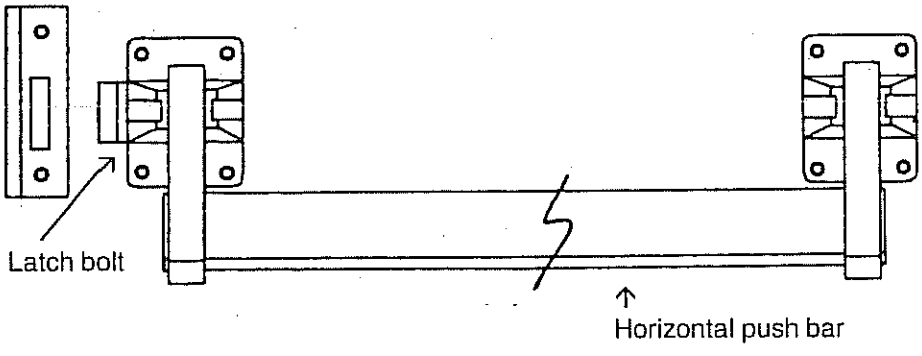


Figure 4.24 - Panic Latch

5.5.2 Spring operated bolts

There is no British Standard controlling the design or manufacture of these devices. As a guide they should be placed at the same height as the "Panic bolt/latch" type

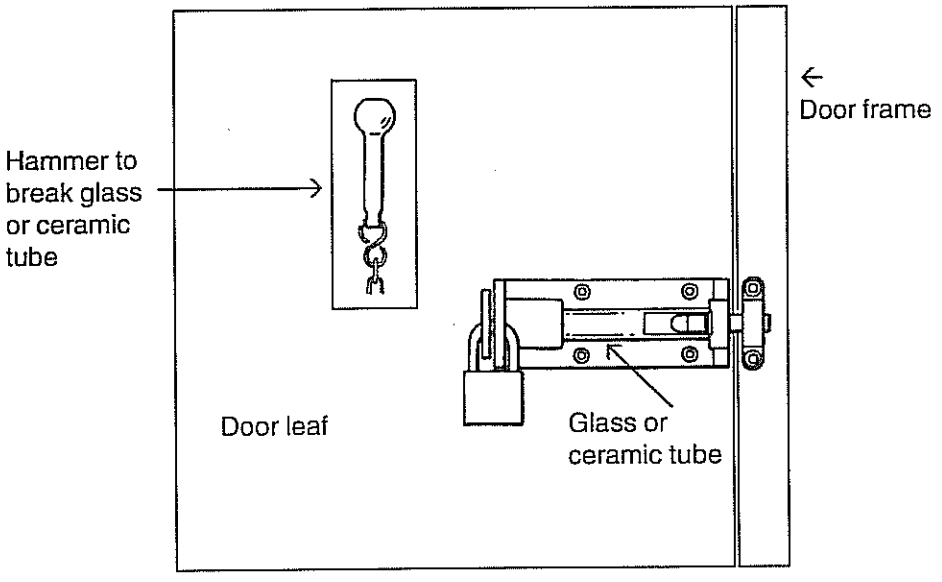


Figure 4.25 - Spring operated bolt

BS 5499 : Part 1 : 1990 states that the standard wording for the break glass types should be "In case of fire break glass bolt to open" and the letters should have a preferred height of 5mm (Section 12 - Signs and Notices).

A similar type of device with a breakable captive component commonly called a "King Pin" device. The manufacturer of this device provides the appropriate sign

5.6 Entryphones

All entryphone system must be fitted with a fail safe device in the event of power failure (i.e. They will unlock)

FIRE STOPPING

This section is produced in association with
Sealmaster

FIRE STOPPING

1.0 INTRODUCTION

1.1 It is essential to ensure that fire, smoke and combustion gases are unable to penetrate fire resisting walls, partitions and ceilings by way of openings in the structure made for the passage of essential services such as drainage, wiring and ventilation, or via gaps at junctions between partitions and walls and where partitions/walls meet ceilings/floors. If these openings are not effectively fire-stopped the required fire resistance of the dividing structure may be lost, thereby prejudicing the means of escape.

1.2 The critical points are:

- Where services pass between risk rooms or between risk rooms and the protected route.
- Where partitions dividing risk rooms from each other or from the protected route meet perimeter walls and ceilings/floors

The following solutions are available :

- Enclose the services within fire resisting construction (2.0)
- Effectively fire-stop the openings in the dividing structure through which the services pass (3.0)
- For gaps in wall/ceiling junctions simply fire-stop the gaps (3.4)

2.0 ENCLOSURE OF SERVICES IN FIRE RESISTING CONSTRUCTION

2.1 This method involves constructing a duct or enclosure to completely enclose the entire length of run of the services within the risk areas. The purpose of the duct is to exclude fire, smoke and combustion gases from its interior, for the relevant period, along the entire length of its run through the risk area.

The method of construction must conform to the relevant period of fire resistance required under the current ***HMO Code of Practice*** (30 minutes generally, 60 minutes in areas of higher fire risk). Great care must be exercised to ensure an efficient fire resisting seal at all points where the duct meets the wall, partition etc. Standard methods of construction should be used in accordance with Sections 1 and 2 (Ceilings and Walls/Partitions) of this Guide. Product manufacturers' specifications must be followed to the letter.

2.2 Where new services are installed this method of protection is often preferred as it provides an aesthetic appeal by hiding the services from view. Where access panels are incorporated into the ductwork at relevant points these should be designed so as to maintain the fire resistant integrity of the duct.

2.3 In existing HMOs services will often be found already enclosed in ductwork but this may have been provided for purely aesthetic reasons. The ductwork is often not of adequate fire resistance and it is important to ascertain its standard of construction prior to acceptance. Where it is not of a satisfactory standard, in accordance with Sections 1 and 2, Ceilings and Walls/Partitions, it should either be removed and replaced with ducting of adequate fire resistance or it should be fire-stopped in accordance with paragraph 3.0 at all points of passage through the structure which require protection under the current ***HMO Code of Practice.***

3.0 FIRE STOPPING AT POINTS OF PASSAGE THROUGH THE DIVIDING STRUCTURE

It is essential to ensure that any fire-stopping method employed would satisfy the relevant period of fire resistance if it were tested to BS 476 : Part 20. In order to meet this requirement only proprietary products designed for the purpose and tested to BS 476 : Part 20 in a ***UKAS registered testing house*** should be used. The product chosen should be appropriate for the situation being considered on site.

Listed below are those areas of concern in relation to fire-stopping which are most commonly encountered on site in HMOs along with products available on the market which may be used to solve these problems. This product list is not exhaustive. Alternative products by other manufacturers are available and may prove equally effective but it is important to ensure the product has been tested as stated above.

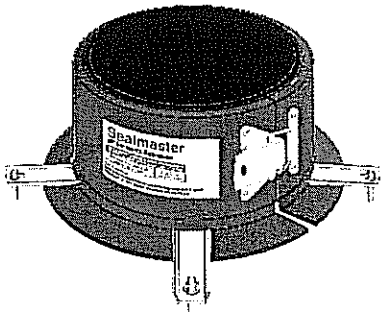
3.1 Passage of plastic pipes through walls/floors/ceilings

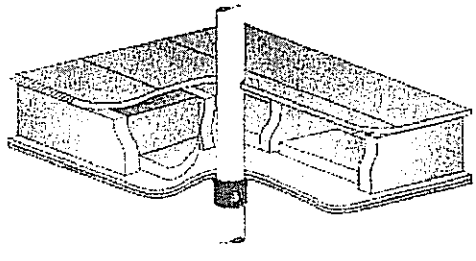
Fire and combustion products may pass through the gap between the pipe and the structure and through the hole left when the pipe melts under the heat from the fire. Most common in HMOs is the passage of a 100mm PVC soil pipe through floors or smaller diameter waste or water pipes through floors or partitions.

3.1.1 Large diameter plastic pipes (50 - 100mm)

Pipe collars or closers are a simple solution. They consist of a pre-formed steel collar which is clamped around the pipe and anchored to the structure with steel fixing brackets. Alternatively, the pipe collar can be cast within the wall or floor. Irregularities to the surface to which the collar is to be fixed are first filled with intumescent mastic. The collar itself contains layers of intumescent material which expand during a fire to crush the heat softened pipe and entirely fill the void.

In the case of plasterboard, surface mounted pipe closers should be fixed to a structural member, e.g. floor joists. If in doubt seek manufacturers' advice.





Figures 5.1 & 5.2 : Sealmaster Fireclose shown in detail and in-situ

"Sealmaster Fireclose" pipe closers provide from 60 minutes to 4 hours fire resistance depending on the surrounding structure.

Similar products include:

"Sealmaster TC1 pipe closer"
"3M PPD Intumescent pipe collar"
"Quelfire QC pipe fire stop seals"
"Nullifire system B150 pipe collars"
"Promaseal pipe collar kits by Promat"

Pipe wraps are an alternative (paragraph 3.1.2)

3.1.2 Small diameter plastic pipes (less than 50mm)

Flexible pipe wraps work in the same way as the collars described above but are available for smaller diameter pipes as well as large diameter. They require the opening to be prepared so as to give a uniform clearance around the pipe. The pipe wrap consists of a strip of intumescent material in a sheathing with either an internal wire mesh or external velcro fixings. The wrap is wound round the pipe and made secure with the velcro or wire mesh. It is then slid along the pipe into the opening in the ceiling/wall. Any minor gaps left are filled with intumescent mastic or paste.

The use of pipewraps is restricted to walls or floors of solid construction.

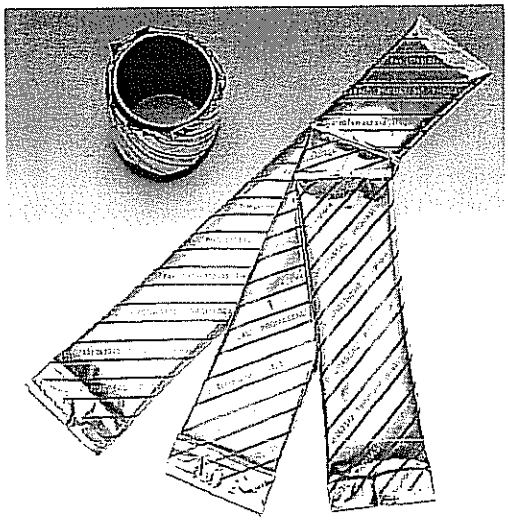


Figure 5.3 - Promaseal pipe wraps by Promat

Promaseal pipewrap provides fire resistance of :

- Up to 60 minutes for pipe diameters over 110 mm (internal)
- Up to 4 hours for pipe diameters less than 110 mm (internal)

Similar products include :

"3M FS195+ high performance intumescent wrap"
"Nullifire system B300 pipe wraps"
"Therm-a-wrap" by Intumescent Seals Ltd.

3.1.3 Multiple small diameter plastic pipes

Where several small diameter pipes pass through openings together, one pipe collar may be used to accommodate them all (description of pipe collar in paragraph 3.1.1)

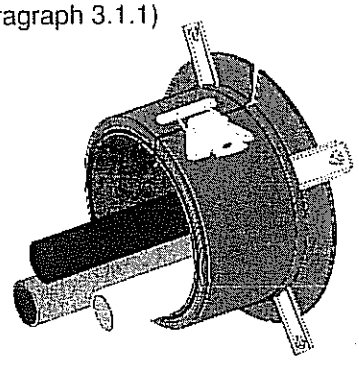


Figure 5.4 - Sealmaster Fireclose Collar

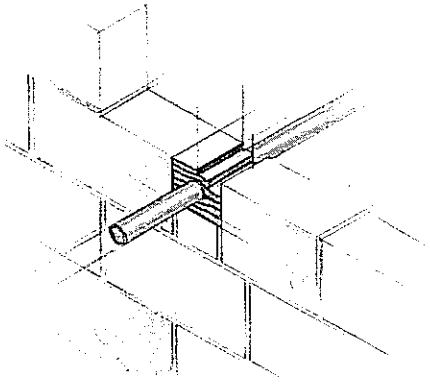
In this case cold smoke will be able to pass through the collar before the intumescent activates. This is solved by packing the unfilled space with *Sealmaster Firefoam* with a skim surface seal of *Sealmaster Masterseal.*
It is not neccesary to pack the full depth of the collar as this is a cold smoke seal only.

3.2 Passage of metal pipes through walls/floors/ceilings

Metal pipes will not melt so readily therefore a lower level of intumescence is adequate. The primary problem is the gap around the pipes although copper may eventually melt forming a small diameter opening. The intumescent products below will fill both the gap around the pipe and subsequently the aperture formed by the melted pipe. A number of products available :

For metal pipes through brick or block walls :
Sealmaster Firefoam will provide in excess of 60 minutes fire resistance for gaps of up to 100mm width.

Figure 5.5: Sealmaster Firefoam sealing a single metal pipe through a blockwork wall



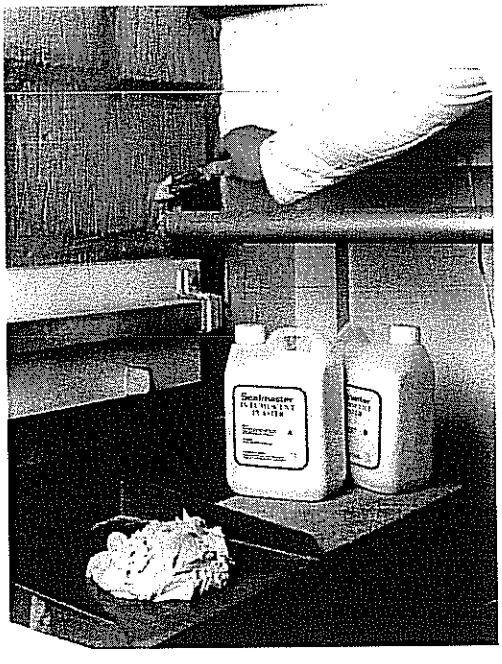


Figure 5.6 : Sealmaster Intumescent plaster sealing a single metal pipe through a blockwork wall

For small gaps around metal pipes through solid or stud walls:
"Sealmaster *Intumescent Plaster*"

Provides 30 or 60 minutes fire resistance depending on depth of fill.

Similar products include:

"Sealmaster Master Seal"
"Quelfire Intumescent mastic"
"Nullifire system B780 fire stop putty"
"Nullifire system B200 compound"
"3M firedam 350 sealant"
"3M mouldable putty"

These products are applied either using a skeleton gun or trowel or in the case of mouldable putty, by hand. Manufacturers' specifications must be followed to the letter. Deep gaps require filling first with mineral wool and then the intumescent product is applied to the minimum thickness specified by the manufacturer.

3.3 Passage of multiple pipes or cables through walls/floors/ ceilings

Rare in HMOs but may be found in large hostels.

3.3.1 Pipe collars/closers

The cables or pipes are run together through the closer
eg *Sealmaster Fireclose* (paragraph 3.1.1 and figure 5.1)

3.3.2 Intumescent bags/pillows

Small bags of intumescent material are stacked up to fill the void. Pipes/cables pass between the bags. These are inert without fire, so can easily be removed for modifications/maintenance to cabling. They are suitable for plastic or metal pipes and all cables. Where pipes/cables run vertically, bags are laid on a metal support mesh.

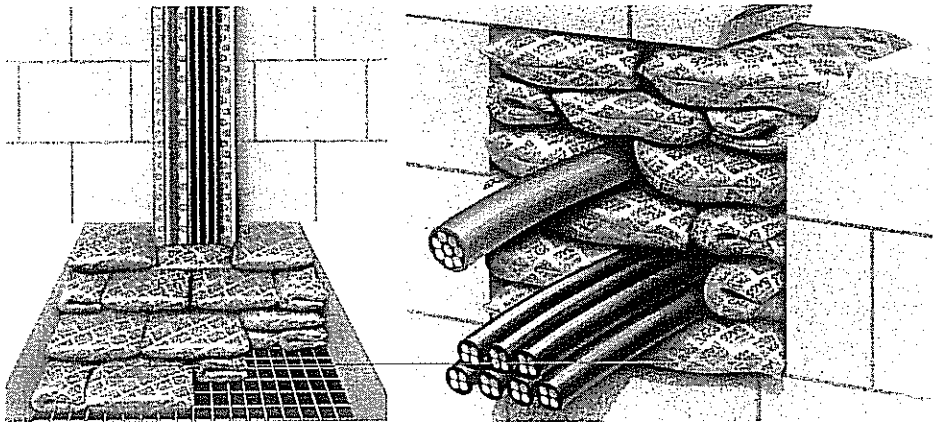


Figure 5.7 & 5.8 - Nullifire System B fire stop bags shown sealing vertical and horizontal openings.

These will provide in excess of 60 minutes fire resistance.

Similar products include:

"Quelfire fire stop pillows"
"Promaseal pillows by Promat"

3.3.3 Fire bricks

Sealmaster firebricks are an alternative to pillows. They are made from high density mineral fibreboard coated with a specially developed intumescent material. They can be cut and shaped with conventional tools. Will provide in excess of 60 minutes fire resistance.

Other more sophisticated systems are available but are unlikely to be encountered in the HMO setting - if so consult the companies listed above for specialist advice.

3.4 Small gaps at junctions of walls, partitions ceilings etc.

Often small gaps appear at the junction of partitions and ceilings or at vertical junctions of partitions with walls. Such gaps should simply be filled with a proprietary intumescent mastic. A double seal is reccomended by application of the compound from both sides of the partition :

Figure 5.9 - Sealmaster Masterseal Compound

This will provide in excess of 2 hours fire resistance.

Similar products include:

"3M Firedam 350 sealant"
"Quelfire intumescent mastic"
"Promaseal mastic by Promat"
"Nullifire System M701 acrylic and M703 silicon sealants"

A further alternative for this use is Sealmaster Firefoam (paragraph 3.2).

3.5 Small holes for single cables etc.

Where single cables pass through fire resisting partitions etc. via very small holes eg ceiling roses, telephone, cable TV etc., the hole should be simply filled with a propritary intumescent mastic as in paragraph 3.4.

3.6 Metallic ventilation ducts

On rare occasions in larger premises, suspended metallic ventilation ducts may be encountered. Where these pass through fire resisting partitions, floors etc. they should be fire protected inside the risk rooms. Several products are available for this purpose. Installation must be fully in accordance with the product manufacturer's recommendations.

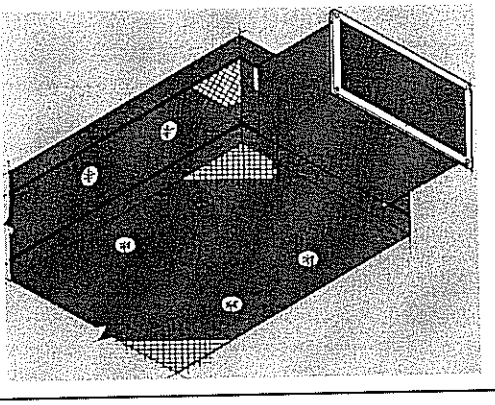


Figure 5.10 - Conlit Ductwork Fire Protection System by Rockwool

Also available for circular ducts.

3.7 Void spaces, roof spaces etc.

Areas of void space may be found above or alongside accomodation through which fire may pass. An example is a common void above suspended ceilings or a standard pitched roof space but may also include voids along eaves etc. Whilst normal methods of compartmentation of the risk rooms will usually deal with these problems, larger properties especially hostels may warrant a fire barrier.

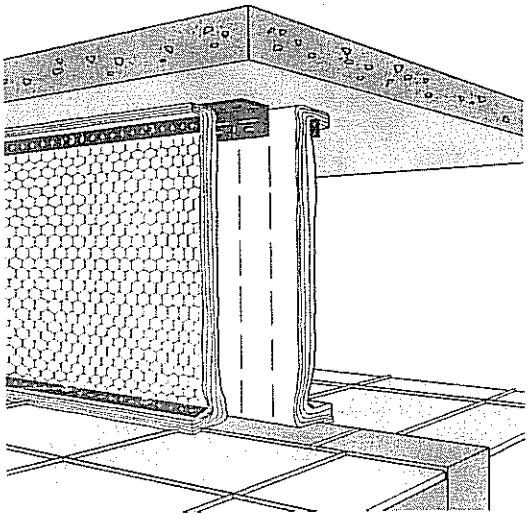


Figure 5.11 - Fire Barrier by Rockwool

This product is a *Rockwool* mat, stitched with wire and faced with wire mesh. It is installed using steel fixings. A single layer of 50mm *fire barrier* will achieve 30 minutes fire resistance. 60 minutes resistance is achieved by installing a double layer (Figure 5.11).

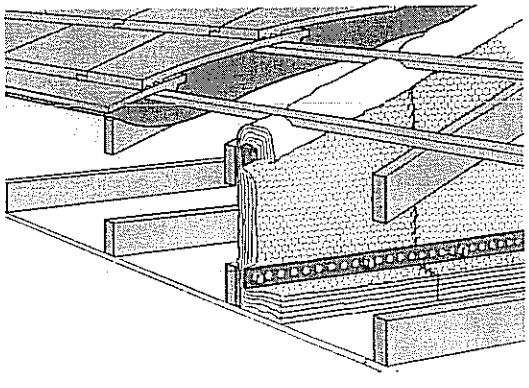


Figure 5.12 - Fire Barrier by Rockwool used in a pitched roof space

Full technical details available from *Rockwool* .

3.8 Recessed lights (Downlighters)

Recessed lights (downlighters) may be encountered within ceilings. Generally these will breach the fire resistance of the ceiling and have little fire resistance of their own. They should be removed.

New products are coming on to the market which claim to solve this problem. Any solution adopted must leave the ceiling with the required level of fire resistance (30 or 60 minutes) and provide an effective smoke barrier.

Any product under consideration must be accompanied by a valid fire test report from a ***UKAS registered testing house*** and where the conditions on site vary from those in the fire test report, the product must be subjected to an assesment by a ***suitably qualified person*** as to its suitability in achieving the required resistance.

This section is produced in association with
FRGGSA and GGF

FRGGSA (Fire Resistant Glass and Glased Systems Association is the primary forum where frame makers, glazing system producers and fire resisting glass manufacturers come together. Entry is vetted and therefore the performance claims of the members are generally able to be substantiated.

Fire Resistant Glass and Glazed Systems Association

FRGGSA provides:

- Information sheets on fire matters relating to glass.
- A code of practice on fire resisting glazing.
- A regularly updated Pyrotechnical service.
- A free technical advisory service.

For further information and a list of members is available from:
Fire Resistant Glass and Glazed Systems Association (FRGGSA)
20 Park Street, Princes Risborough, Bucks HP27 9AH
Telephone: 01844 275500 · Fax: 01844 274002

- For safety's sake use a FRGGSA member -

The GGF (Glass & Glazing Federation) is the Trade Association for the whole of the architectural flat glass industry. In 1989 some 60 members of the Federation formed the Fire Resistant Glazing Group, whose primary task is refurbishment within the construction industry.

The GGF Fire Resistant Glazing Group also provides, or will arrange for:-

- Data Sheets on all aspects of the installation of fire resistant glazing, with regular updates.
- FIRAS Accreditation for installers and surveyors, now numbering some 600 from 50 participating companies (including stockists of fire resistant glasses).
- Full help-line for installation problems (via FIRAS and GGF)
- Comprehensive lists of members.
- Full vetting procedure of all member companies for commercial integrity before membership is granted.
- Advice on Building Regulations regarding fire related problems.

Further information is available from:
Glass & Glazing Federation (GGF), 44-48 Borough High Street, London SE1 1XB
Telephone: 0171 403 7177 · Fax: 0171 357 7458

- Always use a GGF member -

GLAZING - FIRE AND SAFETY

1.0 INTRODUCTION

The current ***HMO Code of Practice*** states that fire resisting glass may be incorporated in a number of areas in an HMO, specifically :

- In a wall separating accommodation from a corridor
- In a screen to separate an escape corridor from a staircase enclosure. Further, the insulation criteria may be waived where the glazed area is at least 1.1m from the floor.
- In a vision panel in a door provided it does not reduce the fire resistance (Section 3 - Fire Resisting Doors)
- Where there are external stairways care must be taken that glazing in windows and doors does not prejudice escape by smoke or flames (Section 7 - Secondary Means of Escape)

For the purposes of this Guide, the level of fire resistance required will be restricted to 30 or 60 minutes when evaluated with respect to BS 476 : Part 22 or BS 476 : Part 8 to 1981.

The following definitions must be understood before glazing can be discussed, namely :

- **Integrity** is the ability of glazing to remain intact, and not permit flames and hot gases to pass through it by way of holes, cracks and fissures etc..
- **Insulation** is the ability of the glazed construction to restrict the temperature rise on the surface of the glass to that permitted in BS 476 : Part 22.

Glass able to satisfy **integrity only** criteria is referred to as **"uninsulated"** (or **"non-insulating"** or **"integrity only"**). Glass able to satisfy both test criteria is referred to as **"insulated"** or **"insulating"** glass.

In order to be satisfied that a particular type and construction of glazing is fire resistant to either of the two standards above i.e. "integrity only" or "insulated glazing" it must have been tested in accordance with BS 476 : Part 22 : 1987.

Officers may come across other types of glazing that provide **partial insulation** and **radiation control.** These are termed as follows :

- **Integrity plus partial insulation** would mean the full standard and time period for integrity, plus a less than full time period of insulation (measured on the surface) e.g. 30 minutes integrity, 15 minutes insulation.

- **Integrity plus radiation control** would mean that the full standard and time period for integrity plus a significant reduction in the transmitted radiation (but not necessarily a restriction on surface temperature).

These **partial insulation** and **radiation control** glasses do not meet insulation criteria of BS 476 : Part 22 : 1987 for 30 minute glazing and therefore, must **NOT** be used in locations requiring insulated glass.

- **Safety Glazing** is glass that either does not break or breaks safely when tested in accordance with and complies with all the requirements laid down in BS 6206 : 1981. It is classified in accordance with BS 6206 Class A, B or C.

2.0 BUILDING REGULATIONS AND THE CURRENT HMO CODE OF PRACTICE

Building Regulations Approved Document B states the specific requirement for fire resisting glazing where "uninsulated" glazing must be installed and where insulated glazing is additionally required. However, unless structural alterations are carried out and the Building Regulations are invoked, officers are advised to follow the guidance set out in the current ***HMO Code of Practice.*** (paragraph 1.0).

Building Regulations Approved Document N states the specific requirements with respect to safety glazing. No reference is made to safety glazing in The current ***HMO Code of Practice.*** However, it is recommended that safety glazing is provided in the areas set out in Approved Document N. (paragraph 6.0 of this Guide)

3.0 TEST DETAILS, PARAMETERS AND USAGE

Glass cannot be fire resistance tested independently from the framework into which it is installed. The thermal characteristics and fire behaviour of the framing play a vital role in establishing the fire performance of the glass. Individual glass manufacturers will normally have tested their glass in a number of "proprietary" systems using both timber and steel framing. These tests do not generally cover the use of the glass in other untested framing systems, pane sizes or pane layouts, as even the depth of glazing bead or the nature of the glazing compound/strip all influence the results significantly.

It is normal for the primary test evidence to be obtained in a ***UKAS registered testing house.*** For the glass or the framing system to have a wider application it is convention to have either ***assessments of performance*** or ***field of application reports*** issued based upon test evidence. Building Regulations Approved Document B recommends that such assessment reports are issued by ***suitably qualified persons.***

The installation shall comply completely with the specification which was tested or which was subsequently assessed, as any variation may lead to unacceptably early failure possibly as low as 5 minutes. Test evidence for single panes should not be used to substantiate the performance of screens consisting of multiple panes of glass. The edge conditions for most clear, unwired glass types are critical and facts such as glazing gaskets and glass edge cover should never be varied outside that tested and/or assessed.

4.0 METHOD OF INSTALLING FIRE RESISTING GLASS

4.1 Fire resisting glazing is probably more dependent upon good installation practice for its performance than almost any other construction product. An incorrectly glazed product may only give **as little as 10%** of its intended/ required performance and there are very few other products that are as sensitive to incorrect installation.

4.2 Purpose Made Constructions

The easiest way to ensure that the product is installed correctly is to specify or install new doors or screens which will either be pre-glazed by the manufacturer or site glazed by the manufacturer's selected labour. By taking this approach it is likely that all critical aspects will be controlled. When specifying complete assemblies it must be stressed that they are to be supported by evidence of performance in the form of a ***fire test report***, ***field of application report***, or an ***assessment*** prepared by a ***suitably qualified person*** for the configuration **and** glass that is to be used. Whilst not being a regulatory requirement (at the time of writing) it is recommended that all primary test evidence is generated in a ***UKAS registered testing house***.

Either the *Glass and Glazing Federation (GGF)* or the *Fire Resistant Glass and Glazed Systems Association (FRGGSA)* are able to provide lists of companies able to provide complete systems.

4.3 Upgrading Existing Constructions

4.3.1 Before considering how to up-grade an existing construction it is imporatant to to establish whether it is substantial enough and in the case of metal, has the correct thermal response characteristics to permit it to be upgraded. It is pointless to fit fire resisting glass into a system that will either burn away, or distort excessively so that there could be a loss of integrity in areas other than the glass.

4.3.2 Frame Details

There are a number of aspects that must be taken into account when establishing whether a construction can be upgraded. These include the size and thickness and type of timber framing members e.g. hardwood or softwood, the size and shape of beads (if they are to be retained), methods of jointing and, in the case of metal systems, the amount of expansion and bow, paint varnish and stain. For large screens this may require expert judgement and ***suitably qualified persons*** may need to be consulted early in the decision making process.

4.3.3 Bead Details

The bead's timber type, density, shape and fixing method are all fundamental to the potential level of fire resistance.

Bead shape is particularly important in the case of **uninsulated** glass where the passage of radiant heat could ignite the bead on the non fire side. The risk can be reduced if the bead is chamfered (angled). Intumescent material between glass and bead can also give additional protection in this instance.

Intumescent material is not necessarily needed with **insulated** glass. This is because the glass does not allow heat to impinge on the cold (non fire) side by radiation. In addition, insulated glass tends to expand slightly and seal the glazing channel from the potential release of hot gases.

4.3.4 Glazing Details

There are a large number of fire resisting glasses available, (paragraph 5.2, table 6.1) most with similar sounding names. These are not interchangeable and most have very specific glazing requirements if they are to work. It is important that the glass manufacturer or his agent is consulted in respect of the critical aspects of the required glazing system so that it can be replicated on site. Because of the highly sensitive nature of much of the fire resisting glass to edge cover, edge damage and handling, it is recommended that all site glazing is undertaken by ***FIRAS*** approved glaziers.

4.3.5 Fire Performance

As with any bespoke system that would be purchased complete it is necessary for any site glazed construction to have evidence of performance available to substantiate its fire performance. It is unlikely that exact test evidence will be in place to cover the upgraded construction and therefore either a ***field of application report***, or a bespoke project specific assessment should be available from a ***suitably qualified person***.

4.3.6 General Guidance

Whilst not being covered by an assessment directly, the following gives guidance as to the minimum sections of timber in a glazed screen or window that may be expected to meet both 30 minute and 60 minute integrity ratings when correctly glazed.

30 Minute Fire Rated Screens

Framing members :

material	-	hardwood or good quality softwood
size	-	Ex(*1) 75mm x 63mm (nom(*2) 68mm x 58mm)

Beads :

material	-	hardwood
size	-	20mm x not less than 15mm high at the glass interface(*3)
shape	-	not critical but preferably chamfered (angled) away from the glass
fixing	-	steel pins, not less than 31mm long at an angle of nominally 45° to the face of the glass(*4)

60 Minute Fire Rated Screens

Framing members :

material	-	good quality hardwood
size	-	Ex(*1) 100mm x 75mm (nom(*2) 90mm x 70mm)

Beads :

material	-	hardwood
size	-	25mm x not less than 20mm high at the glass interface(*3)
shape	-	chamfered away from glass at an angle of nominally 25°
fixing	-	steel screws, not less than 38mm long at an angle of nominally 45° to the face of the glass(*4)

(*1) Ex = sawn or original timber sizes.

(*2) Nom = planed or finished timber sizes.

(*3) The edge cover to the glass shall not differ from that recommended by the manufacturer or given in the evidence of performance.

(*4) Fixings must **never** make contact with the glass.

4.3.7 Metal Screens

Only steel constructions are suitable for upgrading, even to 30 minutes, as aluminium melts at temperatures of less than 700°C, a temperature reached in a fire during the first 20 minutes. Box sections with screwed on steel beads (channels or angles), nominally 50mm square are capable of being upgraded. 'T' section steel frames need expert consideration due to their tendency to bow and twist.

shape - chamfered away from glass at an angle of nominally 20°.
fixings - steel screws, not less than 31mm long at an angle of nominally 45° to the face of the glass. [4].

4.3.8 60 Minute Rated Screens

60 minutes integrity is extremely difficult to achieve using timber constructions and it is not uncommon to require special fire protective linings to be used around glazed openings to compensate for the erosion of the timber. Only a restricted range of fire resisting glasses are able to provide 60 minutes fire resistance, particularly in the larger pane sizes. Expert advice should always be sought when contemplating one hour glazing applications.

5.0 GLASSTYPES

5.1 Overview

There are now many different fire resisting glasses, each of which has its own specific glazing requirements. Despite the similarity of the names, there is no equal or approved status between any of them. Putting the wrong glass in the wrong glazing rebate can reduce the potential performance of some glasses to as little as 4 minutes. The only sure method of establishing the critical factors in ensuring the performance of any particular glass type is by contacting the manufacturer. There are a number of product groupings that can be considered as given below:

Type Code	Description of glass
GA	Integral, wired soda/lime glasses
GB	Non-integral, wired soda/lime glasses
GC	Clear monolithic, borosilicate composition glasses
GD	Clear monolithic, toughened, soda/lime composition glasses
GE	Clear monolithic, ceramic composition glasses
GF	Clear, laminated, non-intumescent glasses
GG	Clear, intumescent laminated glasses
GH	Clear, gel intumescent sandwiched glasses

These codes are used in Table 6.1. Only glass types GA can be obtained locally and cut on site although some of the other glass types might be cut by specialist local stockists. Most clear monolithic glasses, except those of ceramic composition, are obtained direct and are supplied cut to ordered size.

5.2 Products Available

Table 6.1 lists those glasses produced by manufacturers who are either members of FRGGSA or GGF. Other glasses are available but officers should ensure that they are suitable and comply with requirements as indicated in this section before permitting their use.

Product Name	Product Type para 5.1	Integrity 'I' or Integrity & Full Insulation 'I/I'	Impact Rating (class) para 6.0	Manufacturer	Availability D - Direct L - Local S - Specialist Stockist
WIRED					
Pyroshield known as Georgian Wired	GA	I	Nil	Pilkington Ltd	L
Pyroshield Safety known as Georgian Wired Safety	GA	I	C	Pilkington Ltd	S
NON-WIRED					
Pyran-S	GC	I	A	Schott Glass Ltd	D
Pyrocet	GD	I	A	Securiglass Ltd	D
Firelite	GE	I	Nil	Southern Ceramics Ltd	S
Pyrostop	GG	I/I	B+	Pilkington Ltd	S
Pyrodur	GG	I	B	Pilkington Ltd	S
Pyrobel	GG	I/I	B+	Glaverbel	S
Pyrobelite	GG	I	B(?)	Glaverbel	S
Pyrosec 19	GD	I	A	Securiglass	D

NB Pyrodur and Pyrobelite give a level of partial insulation but they are not acceptable if "insulated" glazing is required

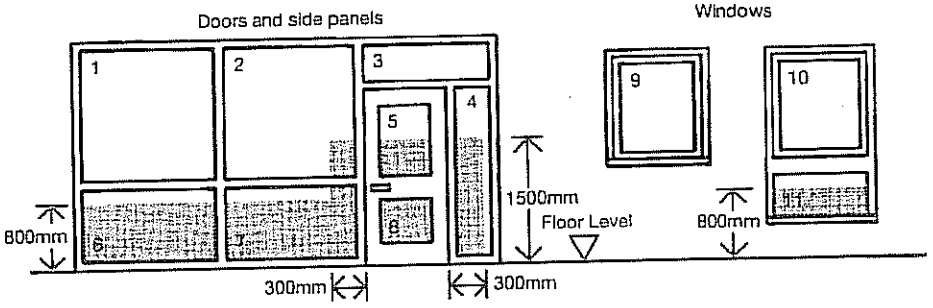
Table 6.1 - To illustrate the types of glasses available and whether they have integrity, insulation and/or safety properties

6.0 SAFETY GLAZING

6.1 Critical Location

Any glass, including fire resisting types, used in critical locations (internal and external) must be safety glass and tested to BS 6206. Critical locations are defined in Approved Document N of the Building Regulations as follows:

Critical locations in internal and external walls



Shaded areas show critical locations to which requirement N1 applies.
(ie. glazing in areas numbered 2,4,5,6,7,8,11)

Figure 6.2 - Critical locations in internal and external walls

6.2 Glass Types

The criteria of Document N can be met in various ways. Glass most commonly used is:

- Small sizes- no restriction on glass type providing the width of the glass is no greater than 250mm, and the area does not exceed 0.5m^2.
- Thick glass - as defined in Approved Document N (N1).
- Laminated
- Toughened
- Reinforced - by heavy wire mesh (e.g. PyroshieldSafety; standard wired glass does not offer any impact safety level).

6.3 Smaller openings with widths up to 900mm may use a glazing material with **class C** impact rating

Openings over 900mm wide require glazing material with at least **class B** impact rating

6.4 Marking

All installed safety glass panels shall be marked as follows. The marks shall be permanent and applied before installation, in a position to remain visible, after installation

- An identifiable name or trademark or other mark capable of identification.
- The type of material.
- The number of the British Standard i.e. 6206.
- The classification relating to impact test behaviour

7.0 CONCLUSION

The type of fire resisting glazing required will depend on the position of the glazing in relation to floor level.

If it is in the **critical location** (paragraph 6.0) it will, in addition be required to be Safety Glazing, class B or C depending on pane size.

If it is sited below 1.1m above the floor level it must, also, be Insulated Glazing. However, this requirement should only be invoked in areas specified in the current *HMO Code of Practice* (paragraph 1.0 of this Guide) unless the Building Regulations apply.

Fixing details will depend on the type of glass, level of fire resistance required, and details on intumescent material used.

8.0 FURTHER READING

- Code of Practice for Fire Resisting Glazing, available from FRGGSA Fire Resisting Glass and Glazed Systems Association, 20, Park Street, Princes Risborough, Buckinghamshire, HP27 9AH
  Tel : 01844-275500 Fax : 01844-274002

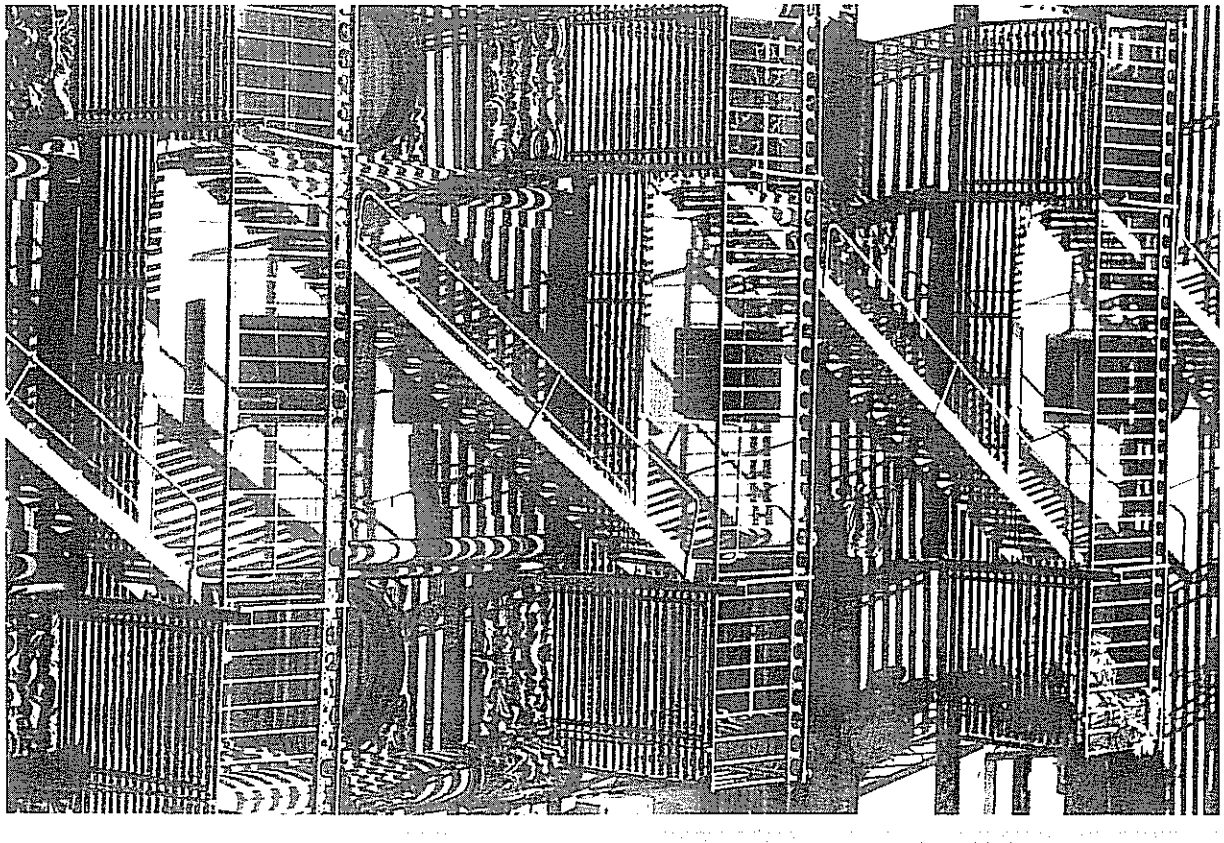
- IFSA/FRGGSA joint Information Sheet No 2; The Role of Intumescent Materials in Timber and Metal Based Fire Resisting Glazing Systems available from IFSA 20, Park Street, Princes Risborough, Buckinghamshire, HP27 9AH
  Tel : 01844-275500 Fax : 01844-274002

- GGF Information Sheets 2.8, 2.8.1, 2.8.2, 2.8.3, available from the Glass and Glazing Federation, 44-48, Borough High Street, London SE1 1XB
  Tel : 0171-403-7177 Fax : 0171-357-7458

- Specific details of glasses can be obtained from the manufacturers listed in Figure 6.1. Their addresses and telephone numbers can be obtained from the organisations listed above.

SECTION 7

SECONDARY MEANS OF ESCAPE



SECONDARY MEANS OF ESCAPE

1.0 INTRODUCTION

HMOs of 6 storeys (ground plus 5 ignoring any basement) require a secondary means of escape from the top storey. Any secondary means of escape must lead to a final exit at street level. It must be a protected route and afford safe, unobstructed travel throughout its entire route.

Secondary means of escape can either be afforded using an external staircase (paragraph 2.0) or using an adjoining building. (paragraph 3.0)

2.0 SECONDARY ESCAPE ROUTE VIA EXTERNAL STAIRCASE

The following requirements are to be met:

- Access from top floor landing (and other floors if desired)
- Access from common parts, not via rooms, bathrooms or WCs (unless impracticable when special arrangements for access may be considered in consultation with the Fire Officer)
- Staircase to terminate at ground floor level
- Staircase to terminate in an area from which there is unobstructed access to the public street without re-entering the building
- Staircase design to meet the criteria in paragraph 4.0.

(Note: the entire route - staircase and roof level walkway - to be adequately lit to the same standard as the protected route generally (Section 10 - Ordinary and Emergency Staircase Lighting)

2.1 Protection of external secondary means of escape

External secondary means of escape staircases and walkways must be protected from the effects of any fire. Windows, doors and other openings which could affect the escape route must therefore be protected.

In practice openings in the following locations must be made fire resisting :

- Doors opening onto the secondary escape or within a zone measured 1.8m horizontally from the escape route must be of 30 minute fire resisting construction (Figure 7.1) - except the access door at the top of the stair which need not be fire resisting. Where doors open from areas of higher fire risk, they must be of 60 minute fire resisting construction. (Section 3 - Fire Resisting Doors)

- Windows opening onto the secondary escape or within a zone measured 1.8m horizontally from the escape route to be of 30 minute fire resisting construction/glazing and to be fixed shut - 60 minutes fire resisting construction if serving an area of higher fire risk (Figure 7.1). (Section 6 - Glazing Fire and Safety)

- Any ducts or openings within the 1.8m zone mentioned above to be fire resisting or fire stopped (Section 5 - Fire Stopping).

- The structure of the building within the 1.8m zone mentioned above to be of minimum 30 minute fire resisting construction (Section 2 - Walls and Partitions).

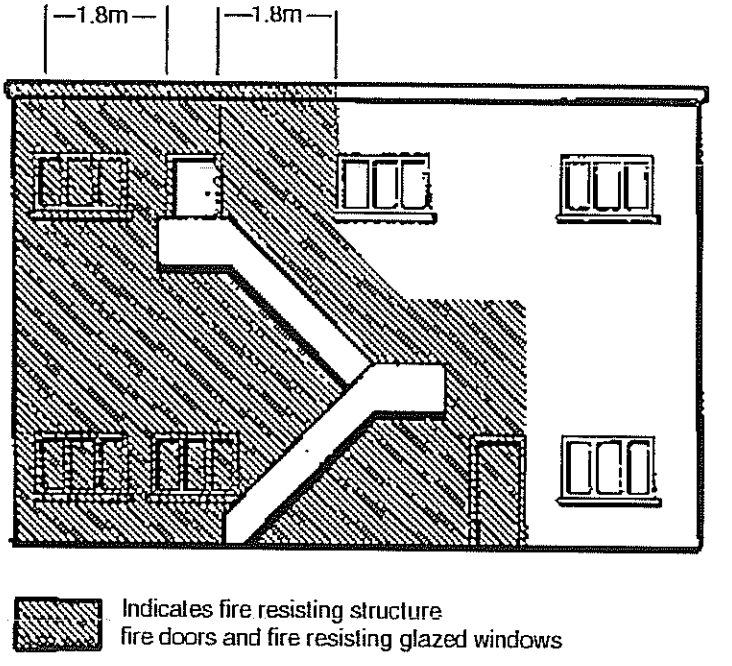


Figure 7.1 Area adjacent to secondary means of escape within which doors, windows, openings etc. are to be of minimum 30 minutes fire resistance (60 minutes where areas of higher fire risk)

3.0 SECONDARY ESCAPE VIA ADJOINING BUILDING

This is most effective where the two buildings involved are in the same ownership. Where the escape is via a building in a different ownership it will be necessary to obtain a legally binding agreement between the two owners to ensure right of access at all times. Officers should seek legal advice on the suitability and effectiveness of each agreement.

3.1 Via roof

Escape may be via the roofs of the two buildings and down into the protected route of the adjoining building (common parts). Free access through the adjoining common parts must be afforded and the route must terminate at a final exit at ground floor giving free access to the street. The following requirements apply :

- The entire length of the secondary means of escape is to be passable without the use of a key, tool or other removable or unfamiliar mechanism,
- Access preferably via a standard door
- Where access not possible via a standard door, the access from the stairway to the roof must be sufficient to allow an adult to pass through with ease. Minimum recommended dimensions 800mm x 540mm.The access should be readily openable in the direction of egress without the use of a removable key or tool and without undue force. To be counterbalanced so as to open automatically in the direction of egress when the catch is operated and remain in the open position.There should be an appropriate top ledge to facilitate access through the hatch onto the roof walkway.
- A fixed walkway across the roof is to be provided.
- Stairs and walkways to meet the design criteria in paragraph 4.0.

3.2 Via party wall

Access to the adjoining property may be via an opening in the party wall linking the two common parts. A 60 minute fire resisting door is required at this opening.

4.0 DESIGN REQUIREMENTS FOR STAIRCASES AND WALKWAYS

Staircases, landings, roof level walkways and access steps to roof escapes are to comply with BS 5395 : Parts 1, 2 and 3 "Code of Practice for the design of industrial type stairs, permanent ladders and walkways".

Staircases, landings and walkways providing secondary means of escape to be provided with artificial lighting to the same standard as the main escape route (Section 10 - Ordinary and Emergency Staircase Lighting)

4.1 Straight stairs

They must meet the following standards:

- Clear width : minimum 600mm, preferred 800mm.
- Pitch : minimum 30 degrees, optimum 35 degrees, maximum 42 degrees, from horizontal
- Going (depth of tread front to back) : optimum 250mm, minimum 225mm, maximum 300mm.
- Rise (vertical distance between treads) : optimum 175mm, minimum 100mm, maximum 220mm,
- Treads to be flat and of non-slip material (or fitted with non-slip nosings 25mm - 50mm).
- Handrails required on both sides of stairs fixed 840mm - 1000mm height measured at right angles from the pitch line and fitted no wider than the tread.
- Minimum headroom clearance : 1.5m measured at right angle from the pitch line

- Balustrades : where fitted must not allow passage of a sphere 100mm diameter to pass through or provide toe holds allowing a child to climb.

For further details refer to BS 5395 : Part 1 : 1977 and Part 3 : 1985

4.2 Spiral/helical stairs

These are acceptable only in exceptional circumstances and subject to following conditions

- Where no more than 30 able bodied persons would use them
- Maximum height 9m
- Minimum diameter 1.5m
- Design criteria to comply fully with BS 5395 : Part 2 : 1984

Spiral and helical stairs will rarely be encountered and will be prefabricated/ factory made. The full details of the design criteria laid down in BS 5395 : Part 2 : 1984 "Code of practice for the design of helical and spiral stairs" are not therefore reproduced here. If this type of stair is under consideration the reader should consult the British Standard.

4.3 Walkways and platforms

These should have minimum requirements of:

- Clear width : minimum 800mm
- Non-skid surface
- Adequate headroom : minimum 2.1m
- Guard rails on either side : height 1.1m with horizontal mid-rail.
- Non-slip steppings for ease of access and egress and for parapet crossings
- Securely fixed : not just by their own weight
- Incline : should preferably be horizontal, maximum allowable incline 10 degrees

For greater detail refer to BS 5395 : Part 3 : 1985

4.4 Unacceptable means of escape

The current ***HMO Code of Practice*** does not permit the following arrangements as secondary means of escape components

- Fixed vertical ladders
- Pull down/raking ladders
- Lowering lines/ropes and other manipulative emergency devices

5.0 ADDITIONAL REQUIREMENTS FOR SECONDARY MEANS OF ESCAPE

The following requirements apply to secondary means of escape regardless of method employed :

- Ordinary and emergency lighting throughout the route in accordance with Section 10 of this Guide.
- Signs and notices along the route in accordance with Section 12 of this Guide.

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FIRE DETECTION AND ALARM SYSTEMS FOR HOTELS AND HOSTELS

1.0 INTRODUCTION

The purpose of the Automatic Fire Detection and Warning (AFD) system within an HMO is to provide a reliable and constant means of detecting the presence of fire and/or smoke at the earliest possible stage in order to provide an audible warning to all occupiers to evacuate the building.

The current ***HMO Code of Practice*** for HMO's states that AFD shall be provided in all houses which are separated into self contained units and are more that 2 floors in height and in all parts of hostel - type accommodation. Systems should comply with the recommendations of the appropriate British Standard.

The Appropriate British Standard for all hostels and hotels is BS 5839 : Part 1 : 1988 (All other dwellings including bedsit HMOs and houses divided into self contained flats are covered by BS 5839 : Part 6 : 1995).

2.0 TYPE OF AFD SYSTEMS AVAILABLE

Several types of system are detailed in the British Standard to meet the needs of a variety of property types and uses :

Type "P" systems are intended to protect property.
Type "L" systems are intended to protect life.
Type "M" systems are manual systems.

Type "L" systems are further sub-divided.

L1 are installed throughout the building and will therefore give a warning wherever ignition may occur.

L2 is a reduced level of protection and is only installed where presence of fire (or the products of fire) would lead to a significant risk to life. It should include areas covered by an L3 system.
Type L2 is the system recognised and approved by the current ***HMO Code of Practice***

L3 systems are installed only for the protection of escape routes

All Hostels and Hotels shall be fitted with an automatic fire detection system complying with BS 5839 : Part 1 : 1988. Type L2. It shall include manual call points.

3.0 INTERPRETATION OF L2

Appropriate types of detectors should be provided in the following locations:

- Living Rooms
- Bedrooms
- Kitchens
- Dining Rooms
- Stairways
- Cupboard/storage areas opening onto escape routes
- Cellars (Where furniture or flammable materials may be stored).
- Attics (Where furniture or flammable materials may be stored).
- Any other area containing a fire risk, e.g. boiler rooms except those with room-sealed, e.g. balanced flue, appliances.

4.0 CIRCUIT DESIGN

4.1 Circuits Containing Fire Detectors

The wiring arrangement of the system should be such that a fault or faults in one zone or the removal of a detector in one zone cannot prevent the operation of the system in other zones in the building.
Furthermore if the system is such that the removal of a detector or call point from the circuit could affect the operation of other detectors, then the removal of that detector should cause a fault signal to be generated at the control equipment. This monitoring of detectors is normally achieved by arranging that the removal of a detector causes a break in the circuit, thereby breaking the monitoring current which normally flows through the "End of Line" resistor
If detectors are designed so that they can be removed (e.g. plug in detectors) then the removal of any detector must not affect the operation of any of the manual call points. The simple monitoring system outlined above may not meet this requirement if manual call points are "down-stream" of the detectors. Special bases and monitoring circuits are normally required in such cases.

Note: Addressable systems have different circuit arrangements. (paragraph 5.0)

4.2 Circuits Containing Fire Alarm Sounders

If the alarm sounders use the same wiring as the detectors i.e. sounders incorporated with the detector base (e.g. "*Squashnis*"), no alarm sounder must be affected by the removal of any detector.
In the event of an open or short circuit occurring in any wiring to the sounder circuit a minimum of one alarm sounder must continue to sound.

4.3 Compatibility

It is important to note that compliance of an individual component with a particular British Standard does not necessarily guarantee that it will work satisfactorily with another component complying with the same Standard. Therefore, where components of a particular installation are made by different manufacturers, it is essential that the compatibility of the components is taken into account in the design of the system.

5.0 ZONING

To ensure a fast and unambiguous identification of the fire source, the building should be divided into zones.
In general the following guidelines should be followed for the use of zones:

If the total floor area of the building is not greater than 300m², then the building need only be one zone, even though it may contain more than one floor.

The total floor area for a zone should not exceed 2000m².

The search distance i.e. the distance that has to be travelled by a searcher inside the zone in order to determine visually the position of the fire, should not exceed 30m.

Remote indicator lamps outside doors, etc. may be helpful, especially if doors are likely to be locked as they make the search of the area easier. However, they cannot be required by a section 352 notice.

Generally, if the building exceeds 300m², then each zone should be restricted to a single storey and the stairway enclosure should form a separate zone.

Addressable systems identify the specific detector or call point that has been activated or is defective. They are therefore very useful in identifying the source of the fire or component defect. These cannot be required in section 352 notices but it is good practice to provide them in the larger HMOs. For the reasons above addressable systems are currently uncommon and the control panel will usually only indicate which zone has been activated.

6.0 AUDIBILITY

The number of fire alarm sounders should be sufficient to produce the following minimum sound level :

- 65 dB(A) or 5 dB(A) above any noise likely to persist for a period longer than 30 seconds in all accessible parts of the building.
- 75 dB(A) at each bedhead in order to wake sleeping persons.

NB. The 65 dB(A) rule should be relaxed in staffed reception areas and where it is the duty of staff to contact the Fire Brigade. This is to ensure that the telephone conversation can be heard by the Brigade.

Audible devices may be electronic sounders or conventional bells but these two types must not be mixed in the same system. The type chosen must be distinct from other audible alarms used for other purposes.

It should be noted that most fire doors will give an attenuation of at least 30 dB(A), particularly as they will be provided with smoke seals. It is therefore unlikely that a sounder outside the room will provide the required sound level inside the room.

There must be at least two sounders in the building (In case of failure of a single fitting).

There is currently no British Standard for sounders

7.0 CALL POINTS

- Must comply with BS 5839 : Part 2 : 1988
- Must be of uniform type throughout the premises
- Break glass call points should be sited on exit routes and in particular on the landings of stairways and at all exits to the open air.
- No person should have to travel further than 30m to reach a call point.
- Generally call points should be fixed at a height of 1.4m above the floor.
- To be sited in areas easily accessible, well illuminated and in conspicuous positions free from obstructions.
- May be flush mounted in locations where they will be readily seen. But, where they are viewed from the side e.g. in corridors they should be surface mounted in order to present a side profile area of at least 750mm^2.

8.0 DETECTORS

Detectors in AFD systems are designed to detect one or more of 3 characteristics of fire:

- Heat
- Smoke
- ~~Radiation (flame) - NOT TO BE USED~~

8.1 Heat Detectors

There are two main types:

- Fixed Temperature - these are designed to operate when they reach a pre-selected threshold temperature.
- Rate of Rise - these are designed to operate when the temperature rises abnormally quickly. But they contain a fixed temperature element.

These then fall into two main categories:

- "Point type" - respond to temperature around a particular spot.
- "Line type" - respond to temperature change along a line of interconnected detectors or along a heat sensitive wire.

Normally "Point type" will be used.

Point heat detectors should comply with BS 5445 : Part 5 (Identical to EN 54 : Part 5) or in high temperature areas those conforming to BS 5445 : Part 8 (Identical to EN 54 : Part 8) should be used. Heat detectors conforming to

BS 5445 : Part 5 or Part 8 always have a fixed temperature element, and may, additionally, contain a rate of rise element.

In order to avoid false alarms, the fixed operating temperature of a heat detector should be at least 20°C, but not more than 35°C above, the normal ambient temperature in the room.

The most suitable heat detector for a small domestic kitchen where there is likely to be a high ambient temperature is a fixed temperature type complying with BS 5445 : Part 8 whose fixed temperature element is set to approximately 90°C, depending on the manufacturer.

In bedsit type accommodation i.e. bedrooms containing a kitchen facility a type complying with BS 5445 Part 5 should be used which has a fixed temperature element set at approx. 60°C.

Heat detectors should not be sited directly over the oven

8.2 Smoke Detectors

There are two main types

- "Ionisation chamber smoke detectors" - these are based on the principle that an electric current flowing between electrodes in an ionisation chamber is reduced when smoke particles enter the chamber.
- "Optical smoke detectors"- these operate by detecting the scattering or absorption of light by smoke particles.

These then fall into two main categories:

- "Point" type which detect smoke at one position.
- "Beam" type which are effectively a "line" type as they detect smoke along a line.

Normally "Point type" will be used.

Point smoke detectors should comply with BS 5445 : Part 7 (Identical to EN 54 Part : 7)

Both ionisation and optical types have a sufficient range of sensitivity to be used for general fire risks. However the choice of detector should take into account the type of fire that may be expected and the need to avoid false alarms.

Ionisation type detectors may be more appropriate in living rooms or dining rooms where a fast burning fire is more likely to create a hazard to occupants than a smouldering fire. However, when certain materials, such as polyurethane foam, smoulder (when lit by a cigarette) they produce relatively large smoke particles to which ionisation detectors are comparatively insensitive. Conversely, false alarms may be caused by very dense tobacco smoke to which optical detectors are more sensitive than ionisation types.

The most common cause of false alarms in dwellings is smoke and other fumes from kitchens. Optical smoke detectors are less likely than ionisation types to respond to fumes from cooking and are therefore the most appropriate type to use near a kitchen facility.

In general, optical type detectors should be installed in ***circulation spaces***, such as stairs, hallways and landings. Optical detectors should also be installed in areas in which a likely cause of fire is ignition of furniture or bedding by a cigarette although there may be a problem of false alarms. Ionisation type detectors may be more appropriate in living rooms or dining rooms where a fast burning fire are more likely to create a hazard to occupants than a smouldering fire.

8.3 Choice of detectors for various rooms

Heat Detectors - Kitchens.
Kitchen area in bedsits.
Boiler rooms.

Smoke Detectors - Stairways.
Corridors.
Living rooms.
Bedrooms.
Stores

*Bedsitting rooms (i.e. with kitchen facilities) should contain a heat detector **AND** a non interlinked smoke alarm which should be mains wired and comply with BS 5446 : Part 1 : 1990. The non interlinked smoke alarm should be wired so as to sound only in the room affected. The heat detector should be be wired to the main control panel to produce an alarm in all zones. The smoke alarm should be sited as far as possible from the cooking facility. (It is acknowledged that this arrangement is outside the scope of BS 5839 : Part 1 but is designed to ensure safety whilst minimising the likelihood of nuisance alarms).*

In bedsits containing a **separate** kitchen facility enclosed with a fire resisting construction careful consideration is required. If the kitchen area is very small and/or poorly ventilated false alarms may result from a standard L2 system when cooking is carried out with the kitchen door open - in such cases the arrangement in italics above may be appropriate. Larger kitchen areas with adequate ventilation will not usually pose a false alarm problem and the standard system should be installed.

8.4 Siting of detectors

The siting and spacing of detectors is of vital importance for an automatic fire detection system. The greatest concentration of smoke and heat will generally occur at the highest parts of the enclosed areas, and it is therefore here that detectors should normally be sited (i.e. on the ceiling).

- Heat detectors should be sited so that their sensitive elements are not less than 25mm and not more than 150mm below the ceiling.
- Smoke detectors should be not less than 25mm and not more than 600mm from the ceiling surface.
- Detectors should not be mounted less that 500mm from any walls or partitions

If the protected space is pitched, e.g. under a roof, they should be sited in the apex.

In stairways, detectors should be sited on every landing.

8.5 Spacing of detectors

8.5.1 Spacing under flat horizontal ceilings of rooms and corridors greater than 5m wide.

For open areas under flat horizontal ceilings, the horizontal distance from any point to the nearest detector should not exceed 5.3m for heat detectors or 7.5m for smoke detectors. This spacing will usually give a coverage of about 100m² per smoke detector and about 50m² per heat detector.

Heat Detector

Maximum distance covered is 5.3m radius i.e. the detector covers a circular area

For a square room this results in 3.5m to wall and 7m between detectors

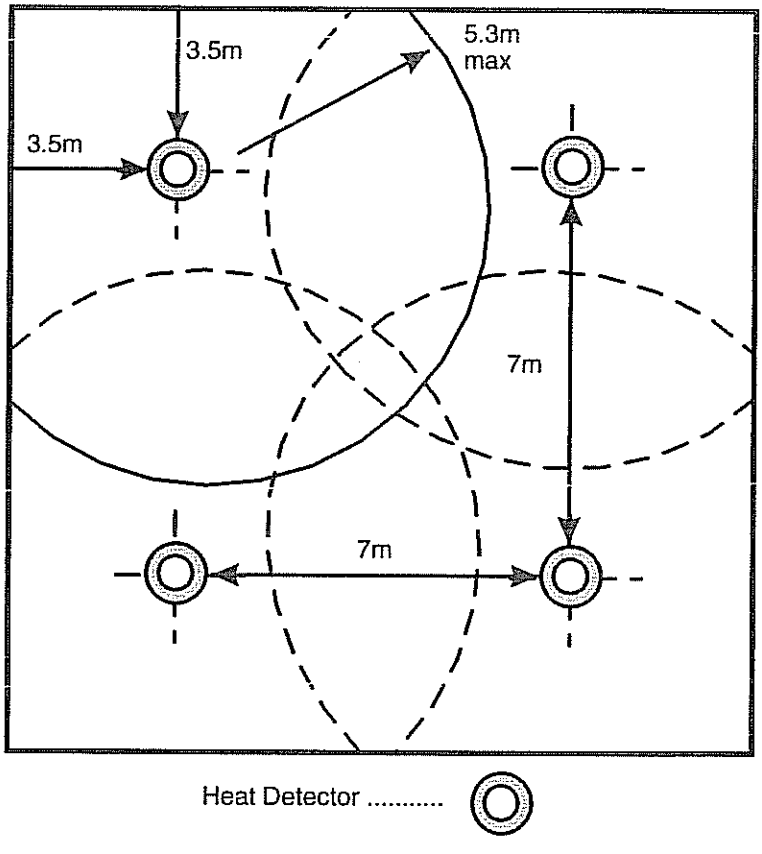

Figure 8.1 - Typical spacing of heat detectors in a square room

Smoke Detector

Maximum distance covered is 7.5m radius i.e. the detector covers a circular area

For a square layout this results in 5m to the wall and 10m between detectors

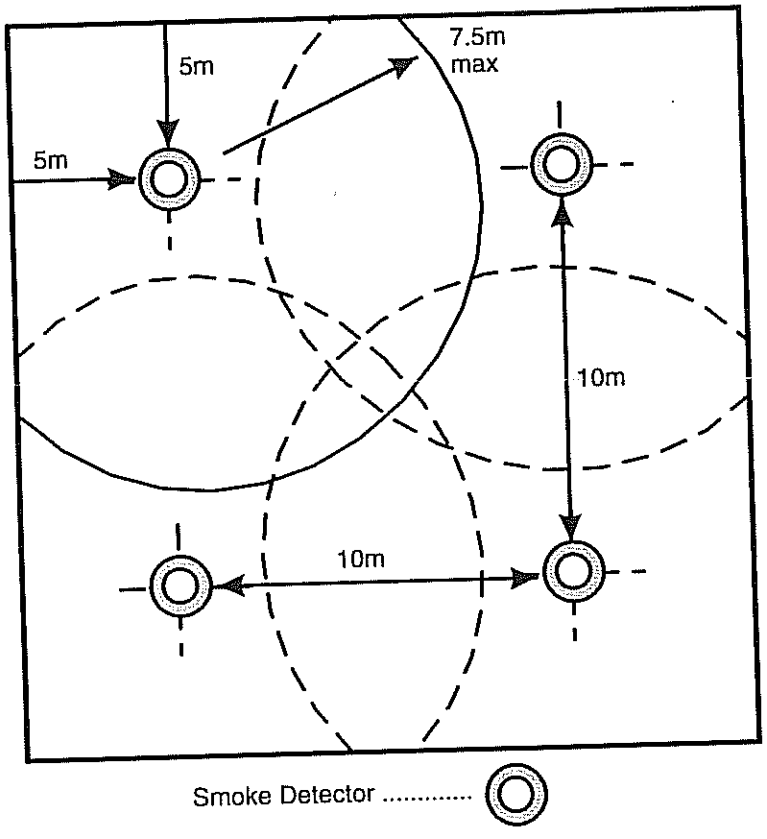

Figure 8.2 - Typical spacing of smoke detectors in a square room

8.5.2 Spacing in a corridor less than 5m wide

Add to the maximum horizontal distance stated in the previous paragraph e.g. for smoke detectors 7.5m, 50% of the difference between 5m and the actual width of the corridor:

Example:

The max. horizontal distance covered by smoke detectors is 7.5m (paragraph 8.5.1)

In a corridor 2m wide.

Take the difference between 5m and the actual width (2m) = 3m

50 % of 3m = 1.5m

Therefore max distance between detectors is 7.5m + 1.5m = 9m

8.5.3 Spacing under a pitched ceiling or roof

Reference should be made to BS 5839 : Part 1 : 1988 clause 12.2.3 for the appropriate distance

8.6 Obstructions

Where the passage of smoke or hot gas from a source to a detector is likely to be disturbed by a ceiling obstruction (such as a structural beam) having a depth greater than 150 mm but less than 10% of the height of the ceiling, the horizontal distance between detectors should be decreased by twice the depth of the obstruction.

Example:

The max. horizontal distance covered by smoke detectors is 7.5m (paragraph 8.5.1)

If the depth of the obstruction is 200mm (0.2m)

Then the maximum distance the detector can reach is 7.5m - (0.2m x 2) = 7.1m

- Where rooms are divided into sections by walls, partitions or storage racks reaching to within 300mm of the ceiling, the dividers should be treated as if they reach the ceiling.
- Where the ceiling obstruction is greater than 10% of the floor to ceiling height, then the areas either side of the obstruction are to be treated as separate rooms.
- Where the obstruction is less than 150mm it can be ignored.
- Placing detectors close or behind columns is not too detrimental provided that the spacing criteria is maintained.
- Detectors should not be mounted less that 500mm from any wall or partition.

8.7 Voids (unused empty spaces)

- Voids in excess of 800mm height are to be covered by detectors.
- Voids less than 800mm in height will not require detectors unless they present a risk of spread of fire between compartments or where extensive spread of fire can take place before detection. Suspended ceilings require care in this respect.

Detection is **not** a substitute for effective fire stopping (Section 5 - Fire Stopping)

9.0 AFD CONTROL EQUIPMENT

9.1 Purpose

To receive, control, record and relay signals from detectors/call points and to activate alarm sounders. Indicates the source of the fire by zone (or specifies detectors/call points in addressable systems). The equipment therefore **controls** the system and **indicates** to the user the conditions detected.

9.2 Specification

To comply with BS 5839 : Part 4 : 1988. This is a detailed technical standard relating to design, functioning, durability, testing and safety of the control equipment. It is not appropriate for inspectors to be fully conversant with its contents. It will be sufficient to be satisfied that the equipment complies with this British Standard.

Control equipment must be marked on its front panel as complying with BS 5839 : Part 4 : 1988. For completeness and greater understanding, a summary of the relevant points contained in this British Standard is included at the end of this section on Control Equipment. The outline of the basic requirements listed below is expanded upon in the summary of the British Standard.

9.3 Basic requirements

The Control Equipment must:

- Activate the alarm sounders when detectors/call-points signal fire situation
- Give a visible indication of the alarm state on the panel
- Operate a further control sounder within or adjacent to the panel
- Indicate within which zone the activated detector or call-point is located by means of a numbered list **and** for complex layouts a plan of the building
- Include manual silencing and re-set switches (automatic silencing/re-set not permitted include a switch for sounding alarm regardless of detector/call-point activation)
- Give an **audible** indication at the panel of the presence of faults in the system (fault re-set may be automatic)
- Give a **visible** indication at the panel of the presence of faults in the system (fault re-set may be automatic)
- Be marked on the front panel as complying with BS 5839 : Part 4 : 1988
- Be marked on the front panel with the manufacturer's or supplier's name and the model/type number of the equipment

Note: Control panels often require the insertion of a key to enable use of any of the controls. Where this is the case a key must be retained on site by the ***Responsible Person.***

9.4 Siting of control equipment

The control equipment is primarily for the use of the occupier of the building (i.e. the ***Responsible Person)*** and the fire brigade in the event of an emergency call out. It should be sited to meet the following requirements :

- readily accessible to building occupiers (i.e. the ***Responsible Person***)

- Readily accessible at a suitable height (i.e. reached without ladder or chair)
- Where staff are on duty, equipment to be sited so that staff are first to attend when alarm sounds
- Immediately accessible to fire brigade on entry to the building
- In an area of low fire risk to ensure alarm is given before equipment is damaged by fire
- In an area covered by automatic detectors linked to the system
- Operating instructions to be displayed near the equipment
- Adequate ambient light level near the panel*1 to ensure all indications (not just the illuminated indicators) are easily legible at all hours
- Out of direct sunlight or illuminated indicators may not be visible
- In a position where the ambient sound level does not prevent audible signals from the panel being heard

The most suitable location in HMOs is the ground floor common hallway just inside the main entrance door.

If there is more than one entrance a ***repeater indicator panel*** is to be sited just inside each main entrance other than where the main panel is sited.

*1 additional lighting may be provided to ensure this requirement is met. If powered from the fire alarm supply then in the event of a mains power failure it must only light during a fire condition (to prevent unnecessary drain on the standby supply) and the additional power load is calculated at the system design stage. However, an emergency lighting luminaire will be provided above the panel to comply with BS 5266 (Section 10 - Ordinary and Emergency Staircase Lighting)

10.0 POWER SUPPLY

Normal supply to be from the standard mains AC power supply. Battery stand-by back-up to provide cover during failure of mains supply.

Arrangements for power supply to meet the following requirements :

- The system to be wired immediately to the dead side of the mains isolating switch i.e. between the electricity supply company's meter and the property's mains isolating switch (as wiring to the live side would result in an unmetered electrical supply to the alarm).
- Connection to the mains via an isolating protective device (an isolating fuse switch or a circuit breaker) reserved *solely* for this purpose. Cable, apparatus etc. to be fully in accordance with the current edition of the IEE Regulations
- Switch to be coloured red
- Switch to be labelled *"FIRE ALARM : DO NOT SWITCH OFF"*
- Switch to be secure from unauthorised operation - if in open area to be within a secure box with frangible cover (i.e. breakable by hand).
- Additional safety warning labels to be provided *2
- Where residual current devices (circuit breakers) are provided, the system to be so wired that interruption of main building supply following a fault will not interrupt fire alarm supply

*2 **labelling** : If wired to the dead side of the mains isolating switch a label to be affixed to the mains isolating switch stating *"Warning, this switch also controls the supply to the fire alarm system".*

If the alarm is fed from the live side of the main isolating switch for the property, a label on the *fire alarm* isolating switch to read in addition to *"fire alarm do not switch off"*, *"Warning , this supply remains live when the main switch is turned off"* and a label on the mains isolating switch stating *"Warning, the fire alarm supply remains live when this switch is turned off"*.

Where electrical supply is via a coin-slot or pre-pay key meter, the alarm MUST be wired into the live side of the meter so that upon expiry of pre-paid time, the alarm continues to receive power. PRE-PAYMENT ARRANGEMENTS FOR FINITE AMOUNTS OF POWER SUPPLY TO ALARM ARE NOT PERMITTED UNDER ANY CIRCUMSTANCES.

10.1 Stand-by/Back-up supply

Usually provided by secondary batteries. These are rechargeable from the normal mains supply by an automatic trickle charger. Minimum expected life expectancy for batteries is four years. Minimum duration of battery power following mains disconnection is 24 hours of adequate power to maintain the whole system at the end of which there should be sufficient power left to sound alarms in all zones for 30 minutes.

10.2 Siting of power supplies

Mains power switch to be secure from unauthorised operation. If in open area to be within a secure box with frangible cover. Batteries in the smaller AFD systems likely to be encountered in HMOs will usually be of a sealed type and be located within the panel of the control equipment. In the unlikely event of larger systems with non-sealed batteries being encountered, consult clause 16.7 of BS 5839 : Part 1 : 1988.

11.0 CABLES AND WIRING

A developing fire in a building will progressively destroy the building contents and structure including wiring to the AFD system. The cables must therefore resist the fire and its effects for a period long enough to ensure the intended function of the system i.e. in HMOs to warn occupiers of fire early enough and for long enough to allow their escape.

11.1 Two types of cable function exist within the AFD system :

A : cables required to continue to function during a fire
("*prolonged operation in a fire*")

B : cables which having served their purpose can fail without detriment
("*not requiring prolonged operation in a fire*")

Situation A : (*prolonged operation.....*)

- All cables between the control equipment and sounders. This is to ensure signals and power continue to pass from the Control Equipment to the sounders enabling the alarm signal to continue to be given for a considerable period into the fire.

- All cables between the control panel and the main fuse switch (paragraph 10.0). This is not a requirement of BS 5839, however it is strongly recommended as good practice.

Situation B : (*not...prolonged operation.....)*

- The link from detectors and call points to the panel. The detectors and call points are essentially triggers. Once they have triggered the panel to sound they can fail as the panel will continue to instruct the sounders to operate.

- The link from the panel to automatic door release units (magnetic door holders). This can fail at an early stage as failure merely closes the fire doors which may be beneficial.

It is important to note that all cabling must be protected from physical damage e.g. impact, rodent attack

11.2 System for the assessment of cables :

BS 6387 details the testing procedure for cables and lays down classifications when tested under 3 categories:

- Resistance to fire alone - ratings A,B,C or S depending on performance
- Resistance to fire with water - rating W when test satisfied
- Resistance to fire with mechanical shock - ratings X, Y or Z depending on performance

The classification required for cables in **Situation A** above *(prolonged operation.....)* is CWZ, meaning .....

- "C" : resistance to fire @ 950°C for 3 hours
- "W" : resistance to fire with water
- "Z" : resistance to fire @ 950°C with mechanical shock

Explanatory note :

BS 5839 : Part 1 requires cables in this situation to comply with AWX or SWX. This is a lower standard than the CWZ rating recommended in this Guide. The reasons are as follows :

- Building Regulations 1991, Approved Document B requires CWZ rating
- NICEIC recommend CWZ rating (Newsletter 108, December 1993)
- The Cable Industry is now manufacturing and testing to CWZ rating as a matter of course

Cables are assessed by a UKAS registered testing house such as British Approvals Service For Cables (BASEC).

11.3 Types of cabling which comply :

For use in **Situation A** above (*prolonged operation....*) :

- Cables with a CWZ rating are required

- All must be protected from mechanical damage e.g. impact and rodent attack

The following examples of proprietary cables are currently available which meet these requirements :-

- Mineral Insulated Copper Covered Sheathed Cables (often termed *MICC* or "*Pyro*"): - acceptable *unprotected* in all situations.
- AEI *"Firetec"* range with its own approved fixings and termination glands - acceptable in all locations subject to conditions (i) to (v) below
- Delta Special Cables Ltd, *"Firetuf OHLS"* Cable with it's own approved fixings and termination glands - acceptable in all locations subject to conditions (i) to (v) below
- Datwyler (UK) Ltd *"Lifeline"* Cable with it's own approved fixings and termination glands - acceptable in all locations subject to conditions (i) to (v) below
- Draka Calflex Cable, *"Calflam"* - acceptable in all locations subject to conditions (i) to (v) below.
- Huber and Suhner A.G., *"Radox FR"* cable - acceptable in all locations subject to conditions (i) to (v) below
- Pirelli *"FP200 Gold"* - acceptable in all locations subject to conditions (i) to (v) below.

Conditions:

(i) To be protected against rodents

(ii) Surface run cables to be protected against mechanical damage to a height of 2.25m from finished floor level

(iii) Cables installed within wall should ideally be protected by metal conduit or metal capping but alternatively by rigid PVC conduit (complying to BS 6099) or non-metallic trunking/ducting (complying to BS 4678 : Part 4).

(iv) Fixing of surface run cables by means of approved clips and the number of fixings and formed radius bends to comply with the current edition of the IEE Regulations and manufacturer's recommendations.

(v) Type of glands to be as specified by manufacturer for use with CWZ rated cables.

For use in **Situation B** above (*not .....prolonged operation....*):

Non-specific cables e.g. PVC insulated twin and earth may be used subject to protection from physical damage and rodent attack (i.e. conditions (i) to (iv) above)

Twin and earth cables are available in LSZH (low smoke zero halogen) constructions. Whilst not a current requirement, these types are recommended as good practice.

11.4 Additional recommendations for installation of cabling:

MICC may be installed in all locations without additional protection

Other cable types listed above to be installed with the following recommendations

- Routed as far as possible in areas of lower fire risk
- Conduits, trunking, channels used for fire alarm cabling to be exclusively reserved for this purpose

- Conduits, ducts and trunking used for fire alarm cabling to be marked as such and the cabling to be completely enclosed when covers are in place
- Where conduits, ducts and trunking passes through floors, partitions etc., attention must be paid to fire stopping between the compartments (Section 5 - Fire Stopping)
- All joints except those within detectors, call points etc., to be enclosed in suitable junction boxes labelled "*fire alarm*".

12.0 SUMMARY OF BS 5839 : PART 4 : 1988 - CONTROL EQUIPMENT FOR FIRE ALARMS

A brief summary of the main contents of the BS follows. This is included for the sake of greater understanding of AFD systems. It does not purport to be a comprehensive or detailed account of the BS but draws the readers attention to the standard and its contents. For further detail refer to the BS.

12.1 Functional requirements :

Control Equipment must :

- Activate the alarm sounders and continue to do so even in the event of a single open circuit or short circuit at any point on the external wiring
- Give a visible indication of the alarm situation
- Operate a "control sounder" within or adjacent to the control panel
- Indicate the zone where the detector or call point was activated
- Be designed so that the system will continue to operate if further detectors/call points are activated subsequent to the first
- Have a response time from activation of a detector to sounding of the alarm of not more than 10 seconds or 3 seconds for a call point
- Ensure that further actions at a call point after 1 second from its activation can not silence the alarm
- Have a manual re-set and silencing facility at the panel (automatic re-set /silencing not permitted following alarm situation)
- Ensure that after silencing, if a further detector/call point is activated the alarm will re-start
- Be designed so that silence/re-set is not possible until detector or call-point is re-set
- Ensure that when silenced at the panel, the visible display on the panel and control sounder in the panel continue until re-set
- Incorporate a panel sounder distinct and different from the alarm sounder - to sound for a minimum of 5 seconds at least every 15 seconds
- Incorporate a manual switch for re-starting the alarm sounders regardless of detector/call point state and silencing switch
- Ensure re-set switch is a biased manual switch so that it is not possible to leave in a re-set position and must require a continuous manual action to operate

The Control Equipment must indicate faults in the system (listed below) in the following manner :

- An audible sounder within the panel (min. 50 dB(A) at 1m from the panel - however possibility of relaxation where panel is sited in or near office from which it is necessary to telephone the Fire Brigade ; 50 dB(A) may inhibit use of telephone Any relaxation only after consultation with LFCDA) - a visible indicator at the panel will be required.
- An indication of zone where fault lies
- Fault signals themselves must not inhibit operation of the alarm unless the fault itself does so
- Indication of disconnection of mains power to remain for at least 24 hours
- Fault indicator to appear on panel within 100 seconds of fault
- Fault warning sounder to be distinct and different to alarm sounder and sound for a minimum 0.5 seconds at least every 5 seconds
- Fault re-set may be automatic or manual once source of fault is rectified
- Fault indicator must not be capable of being over-ridden by re-set switch, if this happens fault indicator must recur within 100 seconds

Faults which are to be indicated as above :

- Short circuit or disconnection of mains power to system
- Short circuit or disconnection of stand-by power
- Short circuit or disconnection within stand-by battery charging system
- Short circuit or disconnection of any detector or call point
- Removal of any plug-in type detector
- Short circuit or disconnection of any leads to sounders
- Interruption of detector scanning/interrogation system
- Rupture of any fuse to the system
- Software or processor failure within the panel

Indicator colours :

Red = Alarm signal
Yellow = Fault signal
Green = Normal power and working condition

Any other indicator on the panel must NOT be red or green

Markings on the panel :

The panel must be marked as complying with BS 5839 : Part 4 : 1988 and have the manufacturer/supplier's name and the type/model number of the equipment.

The BS also contains several provisions relating to construction standards, durability etc., and lays down a number of tests the equipment must pass to satisfy the BS. There are also electrical safety requirements, and a number of criteria relating to survival in hostile environmental conditions.

13.0 COMMISSIONING, CERTIFICATION AND SERVICING OF PART 1 SYSTEMS

BS 5839 : Part 1 lays down procedures for commissioning a newly installed alarm system and on-going servicing and maintenance commitments.

13.1 Commissioning a newly installed system

On completion of the installation the ***Responsible Person*** should be supplied with adequate instructions on its use, routine attention and test procedures. Wiring diagrams of the system would be included and should be kept up to date and available for reference.

The installer should supply the user with a ***log book*** and *a* ***certificate of installation and commissioning.*** (model forms - paragraph 16.0)The certificate should certify that the installation complies with recommendations in BS 5839 : Part 1. If any deviations have been agreed, a statement of these deviations should be given by the installer.

13.2 The Commissioning Test

The system should be tested to ensure that it operates satisfactorily and that in particular:-

- The alarm devices comply with the recommendations of clause 9 in BS 5839 : Part 1 for audibility.
- All detectors and manual call points function correctly and initiate the correct operation.
- Any connection to the fire brigade or remote staffed centre operates correctly.
- Any radio links have adequate signal strength (clause 18.4 in BS 5839).
- Any signals to supplementary equipment are given correctly.

13.3 Handover

When commissioning and certification are complete, the system should be formally handed over to the user.

13.4 Extensions and alterations to an existing system

If the work is an extension of an existing installation, the existing equipment should be thoroughly tested to ensure that it will function satisfactorily in conjunction with the new equipment.

13.5 Action required by inspecting officer

The Case Officer should :

- Witness the commissioning test,
- Test a sample of the detectors and call points
- Test audibility levels in a selection of rooms using a sound level meter.
- Check main power supply source (paragraph 10.0)

However, a detailed inspection is *not* recommended as the commissioning certificate must be relied upon to prove that the system has been installed to BS 5839 : Part 1.

13.6 User responsibilities

The owner or other person having control of the premises should appoint a ***Responsible Person*** to supervise the system i.e. daily, weekly and monthly maintenance and testing and to arrange for the ***Competent Person*** to service and test the system.

Procedures should be laid down for dealing with alarms or fault warnings.

The ***Responsible Person*** should ensure that a clear space is preserved in all directions below detectors and that all manual call points remain unobstructed and conspicuous.

Responsible Person : a person appointed by the owner or other person having control of the premises to supervise the system. This person should be given sufficient authority to ensure the carrying out of any necessary work to maintain the system in correct operation, to maintain records to ensure the system is serviced as detailed below.

13.7 Log Book

The ***Responsible Person*** should ensure that a ***log book*** (model - paragraph 16.3) is kept in which the following should be included:-

- The name of the ***Responsible Person.***
- Brief details of any servicing arrangements.
- Dates and times of all alarms (genuine, practice, test or false) together with their causes where known.
- Dates and times of all defects and faults.
- Dates and types of all tests.
- Dates and types of all servicing (routine or special).
- Dates and times of all periods of disconnection or disablement.
- All alterations to the system.
- The log book should be available for inspection by any authorised person.

13.8 Servicing

An agreement should be made with the manufacturer, supplier or other competent contractor for regular servicing. The name and telephone number of the servicing organisation should be prominently displayed near the control panel. The occupants of the premises should be notified before any testing takes place.

13.9 Servicing and testing requirements

Inspections and tests should be carried out at the following intervals:

- Daily (13.9.1)
- Weekly (13.9.2)
- Monthly (13.9.3)
- Quarterly (13.9.4)
- Annually (13.9.5)
- Every five years (13.9.6)

The daily, weekly and monthly tests can be carried out by the ***Responsible Person*** appointed by the user.

The quarterly, annual and five - yearly tests must be carried out by a ***Competent Person.***

13.9.1 Daily

Ideally a check should be made each day to ensure that the control panel indicates normal operation and that any fault warning from the previous day has received attention.

13.9.2 Weekly

At least one detector or call point in each zone should be tested to ensure correct operation of the system. Any defect should be recorded in the log book and action taken to correct it.

13.9.3 Monthly

If an emergency generator is used in the system, it should be started up every month by a simulation of a power failure. (refer to clause 29.2.5 of BS 5839 for further details of tests for large systems).

13.9.4 Quarterly

The ***Responsible Person*** should ensure that every three months the following checks are made by a ***Competent Person:-***

(The HSE definition of a ***Competent Person*** is: "*A person trained and experienced so as to be able to properly examine, test and undertake any appropriate remedial action and to present the information in a report).*

- Entries in the log book should be checked and any necessary action taken.
- Batteries and their connections should be tested to ensure their good condition.
- At least one detector or call point in each zone should be activated to ensure the correct functioning of the system. All fault indicators and their circuits should be checked, preferably by simulation of fault conditions.
- A visual inspection should be made to check whether structural or occupancy changes have affected the requirements for the siting of manual call points, detectors or sounders.
- All further tests recommended by the installer, supplier or manufacturer.
- Upon completion of the work a ***certificate of testing*** (model - paragraph 16.2) should be given to the ***Responsible Person.***

13.9.5 Annual test

Annually, the quarterly tests detailed **13.9.4** above should be carried out. In addition, each detector should be checked individually for correct operation in accordance with manufacturers recommendations and a visual inspection should

be made to confirm that all cable fittings and equipment are secure, undamaged and adequately protected. A ***certificate of testing*** (model - paragraph 16.2) should be issued to the ***Responsible Person***.

13.9.6 Every five years

The ***Responsible Person*** should ensure that the installation is tested by a ***Competent Person*** in accordance with the testing and inspection requirements of the current edition of the IEE Regulations and a ***periodic test certificate*** should be issued to that person.
A ***certificate of testing*** under this British Standard should also be issued (model - paragraph 16.2)

13.10 Action after a fire

The ***Responsible Person*** should ensure that the following action is carried out as soon as possible after any fire:

- Each detector/call point to be tested
- Each sounder to be tested
- A visual examination to be made of any other part of the system which might have been damaged
- Any defect found to be recorded in the ***log book*** and immediate action taken to correct the defect
- The servicing company to be informed of the fire and instructed to carry out a check of the system
- On completion of the above a ***certificate of testing*** (model - paragraph 16.2) to be given to the ***Responsible Person***
- Records to be updated in respect of any changes to the system

13.11 Action after a false alarm

The ***Responsible Person*** should ensure that the following action is carried out as soon as possible after any false alarm :

- Identify the detector or call point which initiated the alarm.
- Establish the cause of the false alarm.
- Reset the system and check that it is functioning correctly.
- Record in the log book and inform organisation responsible for servicing.

If there are repeated false alarms, the servicing organisation should investigate (paragraph 15.0)

13.12 Prolonged periods of disconnection

If the system is disconnected for a long period, for example if the property is left vacant, on reconnection it should be re-tested as for the annual inspection.

13.13 Non routine attention

The system may require further attention after:-

- Extensions or alterations to the premises.
- Changes in occupancy or activities in the area covered by the system.
- Changes in the ambient noise level or sound attenuation such as to change the sounder requirements.

- Damage to the installation even though no fault may be immediately apparent.
- Any change to ancillary equipment.

14.0 MAINTENANCE OF DETECTORS

14.1 Smoke detectors

Care should be taken to ensure that the sensitivity of smoke detectors is maintained. Accumulation of dirt and dust can adversely affect their sensitivity. If the detectors are found to be accumulating dust, they should be checked more frequently.

14.2 Heat detectors

The sensitivity of heat detectors can be affected by being painted over or damaged so they should be inspected visually frequently. 2% should be tested with a heat source annually and if they fail to operate properly, the cause should be investigated and steps taken to ensure that other detectors are not affected in the same way.

15.0 FALSE AND UNWANTED ALARMS (NUISANCE ALARMS)

Many false alarms are caused by activities in the vicinity of detectors. The ***Responsible Person*** should ensure that all persons in the building are aware of the automatic fire detection system. Anyone working in the building should also be made aware of the system so that false alarms are not generated.

The average rate of false alarms from an installation should not exceed one false alarm per year per ten detectors. The number of false alarms from an individual detector should not exceed one false alarm per two years. If there are repeated false alarms, the servicing organisation should investigate.

Possible remedies include :

- Adjusting sensitivity of detector(s) affected
- Changing type of detector e.g. optical to ionisation
- Re-siting detectors
- Clean detector heads and/or general environment
- Providing better ventilation
- Eliminate draughts

16.0 MODEL CERTIFICATES

16.1 Model installation certificate under BS 5839 : Part 1 : 1988

Certificate of installation and commissioning of the fire alarm system at :

Protected area.....

Address.....

.....

My attention has been drawn to the recommendations of BS 5839 : Part 1 : 1988; in particular, to clauses **14** (false alarms), **28** and **29** (user responsibilities).

In accordance with BS 5899 : Part 1 : 1988, subclause **26.1**, record drawings and operating instructions have been supplied and received by :

Signed.....Status.....Date.....

For and on behalf of the (user).....

.....

In accordance with BS 5839 : Part 1 : 1988 subclause **26.2**, the installation has been inspected and found to comply with the recommendations of the code.

In accordance with BS 5839 : Part 1 : 1988 subclause **26.3**, the insulation of cables and wires has been tested.

In accordance with BS 5839 : Part 1 : 1988 subclause **26.4**, the earthing has been tested

In accordance with BS 5839 : Part 1 : 1988 subclause **26.5**, the entire system has been tested for satisfactory operation.

In accordance with BS 5839 : Part 1 : 1988 subclause **26.6**, it is certified that the installation complies with the recommendations of the code , other than the following deviations:

Signed (Commissioning engineer).....
Date.....

For and on behalf of (installer).....

.....

The system log book is situated.....

The system documentation is situated.....

16.2 Model certificate of testing of a fire alarm system under BS 5839 : Part 1 : 1988

Certificate of testing of a fire alarm system at :

Protected area :.....

Address.....

.....

The system is operational and has been checked and tested in accordance with BS 5839 : Part 1: 1988:

* clause **27** Extensions and alterations to existing system

* subclause **29.2.6** Quarterly inspection and test

* subclause **29.2.7** Annual inspection and test

* subclause **29.2.8** Wiring check

* subclause **29.3.2** Servicing after a fire

* subclause **29.3.3** Servicing following a false alarm

* subclause **29.3.3** Servicing following excessive false alarms

* subclause **29.3.4** Servicing following a fault

* subclause **29.3.5** Servicing following a pre-alarm warning

* subclause **29.3.7** Other non-routine attention specify.....

.....

* delete if not applicable

Signed ..... Status.....

Date.....

For and on behalf of (user or service organisation).....

.....

16.3 Model log book

Log book

Foreword
It is recommended that this log book is maintained by a responsible executive who should ensure that every entry is properly recorded. An "event" should include fire alarms (whether real or false), faults, pre-alarm warnings, tests, temporary disconnection's and the dates of installing or servicing engineer's visits with a brief note of work carried out and outstanding.

Reference data

Name and address .....
.....

Responsible person .....Date.....

.....Date.....

.....Date.....

.....Date.....

The system was installed by .....

and is maintained under contract by .....until.....
Telephone number .....who should be contacted if service is required

Event Data

Date	Time	Counter reading*	Event Action Required	Date completed	Initials

.....

Expendable component replacement due (list) :.....
.....
.....

This section is produced in association with
Notifier, Delta, Abel and Apollo

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Notifier is a subsidiary of the Pittway Corporation, the world's leading manufacturer of electronic fire and security equipment including control equipment and fire detectors. Notifier itself has manufacturing units in Connecticut, USA and West Sussex, England, where fire detection systems are manufactured prior to distribution to all parts of the world.

Notifier are fully committed to the raising of standards in the field of fire detection systems. The need for clear guidance on regulations and standards is a feature of this, and as such we wholeheartedly support this valuable document.

If we can be of assistance on any aspects of fire detection please feel free to call us.

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NOTIFIER Limited
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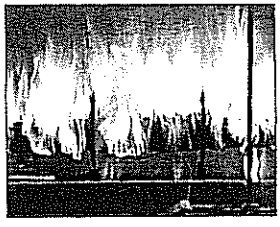
Tel: 01444 230300 · Fax: 01444 230888



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A NATIONAL COMPANY WITH LOCAL CONNECTIONS

For information and advice
freephone 0800 160 160

Head Office:
4 Vaughan Way,
Leicester.
LE1 4ST

Suffolk Lodge,
Wingfield Road,
Stratford,
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84 Barden Road,
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FIRE DETECTION AND ALARM SYSTEMS FOR HMOs

1.0 INTRODUCTION

The purpose of the Automatic Fire Detection and Warning (AFD) system within an HMO is to provide a reliable and constant means of detecting the presence of fire and/or smoke at the earliest possible stage in order to provide an audible early warning to all occupiers to evacuate the building.

The current ***HMO Code of Practice*** states that AFD shall be provided in all houses which are separated into ***self contained units***, and are more that 2 floors in height and in all parts of hostel - type accommodation. Systems should comply with the recommendations of the appropriate British Standard.

The appropriate British Standard for all Houses In Multiple Occupation with the exception of hostels and hotels is BS 5839 : Part 6 : 1995 (hotels and hostels are covered by BS 5839 : Part 1 : 1988).

BS 5839 : Part 6 : 1995 should, therefore be applied to all HMOs (including those of 1 and 2 storeys) i.e bedsit HMOs and houses divided into self contained flats.

It does not apply to purpose built blocks of flats except where a flat is in multiple occupation where it would apply to that flat.

Unlike BS 5839 : Part 1, Part 6 is not a prescriptive standard but is based on the principles of risk analysis. It should be treated with flexibility. The standards recommended in Part 6 are to be regarded as base guidelines.

The standard states that the design of the system, particularly in respect of factors such as the number and siting of detectors and the form of power supply should take into account the following probabilities:

- The probability of the fire occurring;
- The probability of injury or death to occupants if fire occurs;
  The combination of the above is regarded as the fire risk

- The probability of the system operating correctly at the time of the fire.
  This is termed system reliability;

- The probability of early detection and warning of occupants in the event of fire.
  This is termed the success rate of the system

System design should ensure there is an appropriate balance between the fire risk, system reliability and the success rate.

2.0 RISK ANALYSIS CRITERIA

2.1 General Principles

- System design must be appropriate to the risk
- In assessing risk consider each room in the dwelling separately
- Consider statistical data on fire incidence in each type of dwelling/room
- Occupant characteristics are relevant
- No risk low enough to obviate the need for some form of detection & warning system in the house

2.2 Specific considerations

- Risk of death from fire in HMOs is 8 - 10 times greater than in single family dwellings
- Smoke in escape routes is the most serious threat to safe escape NB Smoke detectors are to be installed in the ***circulation spaces*** of all dwellings.
- 50% of all fatalities occur in the room where the fire originates - in HMOs this figure is 60%
- Nearly 50% of all fatal fires start in living rooms or dining rooms
- 30% of fatal fires start in bedrooms
- 15% of fatal fires start in kitchens
- Greatest risk of death from fire is when occupants are asleep
- Fires resulting from smoking are the most common cause of death and the 2nd most common cause of fire. In most cases, the item ignited is furniture or bedding.
- Space heating appliances are the second most common cause of fire deaths
- Fires from electrical appliances/wiring cause 8% of deaths
- Most prevalent single cause of electrical fires (other than cookers & heaters) are electric blankets
- Elderly people and children are at significantly greater risk.
- Socially deprived people on low incomes at greater risk generally
- Arson is a growing problem particularly in HMOs.

These principles and statistical facts must be taken into account when specifying a system for a particular property or property grouping.

3.0 DESIGN CONSIDERATIONS/GRADES OF SYSTEM

BS 5839 : Part 6 grades the systems to be used in dwellings according to the assumed risk. For the purpose of specifying a fire detection and alarm system and the associated engineering design parameters there are six grades. These grades are defined as follows:-

Grade A - This is a fire detection and alarm system that is designed and installed in accordance with the recommendations of BS 5839 : Part 1 : 1988, except clauses relating to search distance, standby supplies, audible and visual alarms (and radio-linked systems) which are replaced by Part 6.

Grade B - This is a fire detection and alarm system including detectors other than smoke alarms, alarm sounders, and control and indicating equipment which either conforms to BS 5839 : Part 4 or to a simpler type laid out in Annex B of BS 5839 : Part 6.

Grade C - This is a system of fire detectors and sounders (which may be combined in the form of smoke alarms) connected to a common power supply with both mains and a standby supply with an element of central control which could be part of an intruder alarm or social alarm system. This grade of system could also comprise a small dedicated fire control panel

Grade D - This is a system of one or more mains powered smoke alarms each with integral standby supply. These are designed to operate in the event of mains failure and therefore could be connected to the local lighting circuit rather than the dwelling's main distribution board.

Grade E - This is a system of one or more mains powered smoke alarms with no stand-by power supply. This grade of system will not function if mains power is disconnected or interrupted. It must therefore be wired to a dedicated circuit at the dwelling's main distribution board.

Grade F - This is a system of one or more battery powered smoke alarms. These are not recommended in HMOs.

NOTE: In Grades D, E and F where more than one detector is installed they are to be interlinked.

4.0 SILENCING AND DISABLEMENT FACILITIES

In order to avoid the use of undesirable methods of disablement, all fire detection and alarm systems within the scope of this part of BS 5839 should be provided with suitable and readily accessible means by which the user can silence fire alarm signals without the use of a tool.

4.1 Grade A systems

The silencing and disablement facilities are provided at the control panel. This gives an audible and visual signal until reset (Full details can be obtained in Section 8 paragraph 12.1 of this Guide)

4.2 Grade D & E systems

There is no requirement to provide a facility to silence the whole system. The silencing facility will be provided on the individual smoke alarm and therefore will only silence that alarm. However, at present only some ionisation type smoke alarms are provided with a silencing button and these must be specified as some models will not be provideed with it. Optical type smoke alarms are not provided with a silencing facility as it had been thought they were less prone to false alarms. However these are expected to be available shortly.

5.0 LEVEL OF PROTECTION: TYPES OF SYSTEM

This standard recommends systems designed to protect life and property in dwellings. The systems are classified as Type LD for those to protect life and Type PD for those to protect property only.

Type LD systems are further sub-divided into:-

- LD1 system is installed throughout the dwelling with fire detectors in all circulation spaces that form part of the escape route and in all rooms and areas other than toilets, bathrooms and shower rooms.

- LD2 system incorporates fire detectors in all circulation spaces forming part of an escape route and in all rooms or areas considered to present a high fire risk on risk analysis (paragraph 2.0)

- LD3 system incorporates fire detectors in all circulation spaces forming part of the escape route. NB This is unlike L3 of BS 5839 : Part 1 which includes detectors in all rooms adjoining the escape route

6.0 CHOICE OF SYSTEM

- **Grade of System**
  The grade of the system that should be installed depends on the nature of the dwelling, the level of fire risk and characteristics of the occupants.

- **Type of system**
  The type of system relates to the level of protection afforded to the occupants and the risk of fire.

7.0 SPECIFIC GUIDANCE ON SYSTEM DESIGN

The British Standard defines a "dwelling" in clause 3.5. For the purposes of Part 6 a dwelling is the "Whole of the building" Thus a "dwelling" includes a bungalow, a house divided into self contained flats and a house converted to provide bedsit accommodation as well as sheltered housing blocks.

Table 2 of Part 6 gives more specific guidance on design of systems. The Table is in three parts

- Single family dwellings
- Houses in multiple occupation
- Sheltered Housing (This subject is not considered in this guidance note)

The Table then lists the types of premises within the broad classes of dwelling.

Single family dwellings
This includes bungalows and whole single family houses but **not** houses converted into self-contained flats. Therefore, this type of dwelling and consequently the first part of Table 2 of BS 5839 : Part 6 will not be considered for the remainder of this Guide

Houses in Multiple Occupation
This category includes all types of HMO as defined by section 345 of the Housing Act 1985 (except hostels and hotels which are covered by BS 5839 : Part 1) i.e. bedsit HMOs and houses converted to self contained flats and all flats in multiple occupation. These are classed in the second part of Table 2 of BS 5839 : Part 6.

8.0 A POLICY FOR AFD WITHIN EACH CLASS OF DWELLING

8.0.1 It is important to note that this a model policy (which has the approval of the London Fire Brigade) and officers must determine whether their Council's policy deviates from it and then make any necessary alterations to this Guide.

When specifying a system it is necessary to have regard to :

- Risk analysis criteria (paragraph 2.0)
- Table 2 of BS 5839 : Part 6

The broad principles of risk in relation to occupant characteristics and the type of building together with the statistics of fire incidence which have been summarised above, can then be incorporated into an analysis in order to adopt a policy for AFD in each category of premises. The proposals outlined below have been arrived at by this approach. All the potential risk factors and statistical information contained in the BS have been utilised in a broad risk analysis of property types commonly encountered.

It is important to note that these are guidelines which if followed will, in the majority of cases, provide a reasonable level of protection. However, individual characteristics of the house should always be considered before specifying a particular system.

8.0.2 The following classes of HMOs will be considered :-

- Houses converted to self contained flats (including studio flats) each occupied by a single household. (paragraph 8.1)
- Bedsit type houses in multiple occupation (paragraph 8.2)
- Shared houses (where they are considered to be HMOs) (paragraph 8.2)
- Houses where there is a mixture of flats in single occupation and bedsit accommodation (paragraph 8.3)
- Flats in multiple occupation (paragraph 8.4)

8.0.3 In 3,4,5 & 6 storey HMOs this guidance recommends L3 type coverage in circulation spaces. It is recognised that no reference is made to L3 in Part 6. Table 2 of Part 6 states that L2 coverage is to be provided in communal areas. However, note 9 to Table 2 states that "BS 5839 : Part 1 recommends that detectors are installed in escape routes and rooms adjoining escape routes....." This is the definition of L3. L3 has, therefore, been used in this Guide.

8.1 HOUSES CONVERTED TO SELF CONTAINED FLATS (INCLUDING STUDIO FLATS) EACH OCCUPIED BY A SINGLE HOUSEHOLD

8.1.1 1 or 2 storey house converted to self-contained flats each of which is occupied by a single household

i.e. no floor level exceeding 4.5m in height above ground and no floor greater than 200 sq. m in area

Grade E system

- Mains wired smoke alarms
- Linked so that all sound when any one alarm is activated
- No stand-by power supply
- Wired to a single independent circuit at the dwelling's (i.e. house's) main distribution board - no other equipment to be connected to this circuit other than a circuit monitoring device.

LD2 type coverage

- Smoke alarms sited in staircase enclosure, landings and hallways and lobbies including internal hallway/lobby of each flat near but not outside the kitchen (False alarms)
- Kitchen, bedrooms and living rooms not covered by smoke alarms
- If no lobby is provided smoke or heat alarms shall be sited in the room(s) adjoining the staircase. Where cooking facilities are provided they shall be heat alarms. In bedsits, in addition to the heat alarm, a non-interlinked smoke alarm, with battery back up, wired to the local lighting circuit and to sound only in the room concerned shall be provided.

Risk analysis factors

- Risk in bedsit type accommodation is generally considered to be approximately 10 times higher than in other types of accommodation. (D.o.E. estimate)
- In single family dwellings - unnecessary to install alarms in kitchens but essential to install in adjacent circulation space (clause 4.2(b))
- Detection should be installed in circulation spaces of all dwellings (clause 4.2 (a))

The above is based on a standard risk premises. If it is clear that the dwelling is subject to unusually high risk factors e.g. if intended exclusively for elderly persons, persons with social problems such as alcohol or drug abuse, then it may be considered appropriate to employ additional smoke alarms in the high risk rooms i.e. bedrooms and living rooms.

If there is a threat or history of electricity cut off to the landlords supply then consideration should be given to supplying a Grade D system (i.e. one supplied with a battery back-up)

8.1.2 3,4,5 or 6 storey house converted to self contained flats each of which is occupied by a single household

i.e. one or more level exceeds 4.5m above ground and/or any floor is greater than 200 sq. m in area

Circulation spaces :

Grade A system

- Fire detection and alarm system designed and installed in accordance with BS 5839 : Part 1, except clauses relating to search distance, standby supplies, audible and visual alarms (and radio-linked systems) which are replaced by this part.
- Control Panel to standard of BS 5839 : Part 4
- Wiring, siting and type of detectors etc., BS 5839 : Part 1 applies

L3 type coverage (Refer to paragraph 8.0.3)

- Smoke detectors throughout staircases, hallways, landings and lobbies (where provided).
- If no lobby is provided smoke or heat detectors shall be sited in the room(s) adjoining the staircase. Where cooking facilities are provided they shall be heat detectors. In bedsits, in addition to the heat detector, a non-interlinked smoke alarm, with battery back up, wired to the local lighting circuit and to sound only in the room concerned shall be provided

Within rooms :

LD2 type coverage

- No detection required in these rooms except where no lobby is provided (see above)

Risk analysis factors

- Risk in bedsit type accommodation is generally considered to be approximately 10 times higher than in other types of accommodation. (D.o.E. estimate)
- in single family dwellings - unnecessary to install alarms in kitchens but essential to install in adjacent circulation space (clause 4.2(b))
- Detection should be installed in circulation spaces of all dwellings (clause 4.2 (a))

The above is based on a standard risk premises. If it is clear that the dwelling is subject to unusually high risk factors e.g. if intended exclusively for elderly persons, persons with social problems such as alcohol or drug abuse, then it may be considered appropriate to employ additional smoke alarms/detectors in the high risk rooms i.e. bedrooms, living rooms, kitchens, boiler rooms etc.

8.2 BEDSIT TYPE HOUSES IN MULTIPLE OCCUPATION

This Section includes shared houses where they are considered to be HMOs

8.2.1 1 or 2 storey house which provides bedsit type accommodation (includes shared houses where they are considered to be HMOs)

i.e. no floor level exceeding 4.5m in height above ground and/or no floor greater than 200 sq. m in area

Grade E system

- Mains wired smoke alarms
- Linked so that all sound when any one alarm is activated
- No stand-by power supply
- Wired to a single independent circuit at the dwelling's (i.e. house's) main distribution board - no other equipment to be connected to this circuit other than a circuit monitoring device.

LD2 type coverage

- Smoke alarms sited in staircase enclosure, landings and hallways and lobbies
- Smoke or heat alarms also sited in bedsits, kitchens, bedrooms and living rooms. Where cooking facilities are provided they shall be heat alarms. In bedsits, in addition to the heat alarm, a non-interlinked smoke alarm, with battery back up, wired to the local lighting circuit and to sound only in the room concerned shall be provided.

Risk analysis factors

- Risk in bedsit type accommodation is generally considered to be approximately 10 times higher than in other types of accommodation. (D.o.E. estimate)
- Detection should be installed in circulation spaces of all dwellings (clause 4.2 (a))
- 40% of fires start in kitchens (clause 4.2 (b))
- 60% of deaths in HMOs occur in room where fire starts. (clause 4.2 (k))
- 50% of fatal fires start in living/dining rooms (clause 4.2 (l))
- 30% of fatal fires start in bedrooms (clause 4.2 (l))
- Greatest risk when occupant asleep (clause 4.2 (m))
- If no detector is installed in the room in which the fire starts, the time available for evacuation of other areas once the fire is detected... may be quite short (clause 7.2).
- If the risk is deemed to be high... LD2 system should be installed .....to protect reliably the occupant of a room where the fire originates ...LD2 system should be provided. (clause 8.2.)

The above is based on a standard risk premises. If it is clear that the HMO is subject to unusually high risk factors e.g. history of unreliability of common power supplies due to landlord's non-payment of bills, it may be appropriate to employ a higher grade of system.

8.2.2 3,4,5 or 6 storey house which provides bedsit type accommodation (includes shared houses where they are considered to be HMOs)

i.e. one or more level exceeds 4.5m above ground and/or any floor is greater than 200 sq m in area

Circulation spaces :

Grade A system

- Fire detection and alarm system designed and installed in accordance with BS 5839 : Part 1, except clauses relating to search distance, standby supplies, audible and visual alarms (and radio-linked systems) which are replaced by this Part.
- Control Panel to standard of BS5839 : Part 4
- Wiring, siting and type of detectors etc., BS5839 : Part 1 applies

L3 type coverage (Refer to paragraph 8.0.3)

- Smoke detectors throughout staircases, hallways, landings and lobbies (where provided).
- If no lobby is provided smoke or heat detectors shall be sited in the room(s) adjoining the staircase. Where cooking facilities are provided they shall be heat detectors. In addition to the heat detector, a non-interlinked smoke alarm, with battery back up, wired to the local lighting circuit and to sound only in the room concerned shall be provided

Within rooms :

- Detectors are to be provided in all risk rooms (i.e. those beyond lobbies or rooms adjoining staircase etc.)

The most practical and economic way of achieving this is to extend the L3 system, provided in the circulation spaces, into the risk rooms (Refer to Note 9, Table 2, BS 5839 : Part 6) i.e. the Grade A system is extended into the risk rooms to provide LD2 coverage.

LD2 type coverage

- Smoke or heat detectors sited in bedsits, kitchens, bedrooms and living rooms. Where cooking facilities are provided they shall be heat detectors. In bedsits, in addition to the heat detector, a non-interlinked smoke alarm, with battery back up, wired to the local lighting circuit and to sound only in the room concerned shall be provided.

(Alternatively, in addition to the L3 system in the circulation spaces, a Grade E system of smoke/heat alarms could be provided in the risk rooms (Refer to Table 2, BS 5839 : Part 6). However, it appears that this method is complicated and less reliable and therefore it is unlikely that this type of protection will be encountered).

Risk analysis factors

- Risk in bedsit type accommodation is generally considered to be approximately 10 times higher than in other types of accommodation. (D.o.E. estimate)
- Detection should be installed in circulation spaces of all dwellings (clause 4.2 (a))
- 40% of fires start in kitchens (clause 4.2 (b))
- 60% of deaths in HMOs occur in room where fire starts. (clause 4.2 (k))
- 50% of fatal fires start in living/dining rooms (clause 4.2 (l))
- 30% of fatal fires start in bedrooms (clause 4.2 (l))
- Greatest risk when occupant asleep (clause 4.2 (m))
- If no detector is installed in the room in which the fire starts, the time available for evacuation of other areas once the fire is detected... may be quite short (clause 7.2).
- If the risk is deemed to be high... LD2 system should be installed .....to protect reliably the occupant of a room where the fire originates ...LD2 system should be provided (clause 8.2).
- Clause 4.2 (k) & (m)

8.3 HOUSES WHERE THERE IS A MIXTURE OF FLATS IN SINGLE OCCUPATION AND BEDSIT ACCOMMODATION

Follow the guidance in the appropriate sections for :

Flats in single occupation (paragraph 8.4)

AND

Bedsits type HMOs (paragraph 8.2)

Generally this will result in :

- **Grade E** system for 1 and 2 storey houses with smoke alarms in the staircase enclosure, lobbies/internal hallways of flats, and bedsits.
- **Grade A** system for houses of 3 or more storeys covering:

  Staircase enclosure

  Lobbies/internal hallways of flats/bedsits

  Inside the bedsits

8.4 FLATS IN MULTIPLE OCCUPATION

Two Situations :

- **Where an FMO is within a bedsit HMO**
  Treat the entire house as a bedsit HMO. (paragraph 8.2)

- **Where an FMO is within a house converted into self contained flats**

  Treat the s/c flats (in single occupation) in accordance with s/c flat section. (paragraph 8.1)

  Additionally treat the FMO in accordance with paragraphs 8.4.1, 8.4.2 & 8.4.3

8.4.1 An FMO within a 1 or 2 storey house converted into self-contained flats

i.e. no floor level exceeds 4.5m above ground and/or no floor greater than 200 sq. m in area

Grade E system

- Mains wired smoke alarms
- Linked so that all sound when any one alarm is activated
- No stand-by power supply
- Wired to a single independent circuit at the dwelling's (i.e. house's) main distribution board - no other equipment to be connected to this circuit other than a circuit monitoring device.

LD2 type coverage

- Smoke alarms sited in staircase enclosure, landings and hallways and lobbies including internal hallway/lobby of each flat
- Smoke alarms sited in bedrooms and living rooms
- Heat alarms sited in kitchens

Risk analysis factors

- Risk in bedsit type accommodation is generally considered to be approximately 10 times higher than in other types of accommodation. (D.o.E. estimate)
- Detection should be installed in circulation spaces of all dwellings (clause 4.2 (a))
- 40% of fires start in kitchens (clause 4.2 (b))
- 60% of deaths in HMOs occur in room where fire starts. (clause 4.2 (k))
- 50% of fatal fires start in living/dining rooms (clause 4.2 (l))
- 30% of fatal fires start in bedrooms (clause 4.2 (l))
- Greatest risk when occupant asleep (clause 4.2 (m))
- If no detector is installed in the room in which the fire starts, the time available for evacuation of other areas once the fire is detected... may be quite short (clause 7.2).
- If the risk is deemed to be high... LD2 system should be installed .....to protect reliably the occupant of a room where the fire originates ...LD2 system should be provided. (clause 8.2)

The above is based on a standard risk premises. If it is clear that the FMO is subject to unusually high risk factors e.g. history of unreliability of common power supplies due to landlord's non-payment of bills, it may be appropriate to employ a higher grade of system.

8.4.2 An FMO within a 3, 4, 5, or 6 storey house converted into self-contained flats

i.e. one or more floor levels exceed 4.5m above ground and/or any floor is greater than 200 sq. m in area

- Extend the L3 system from the common parts into the FMO's communal kitchen, living room and bedrooms

Grade A system

- Fire detection and alarm system designed and installed in accordance with BS 5839 : Part 1, except clauses relating to search distance, standby supplies, audible and visual alarms (and radio-linked systems) which are replaced by this part.
- Control Panel to standard of BS 5839 : Part 4
- Wiring, siting and type of detectors etc., BS 5839 : Part 1 applies

LD2 type coverage

- Smoke detectors sited in hallway, living room and bedrooms.
- Heat detectors sited in kitchens,

(Alternatively, in addition to the L3 system in the ***circulation spaces***, a Grade E system of smoke/heat alarms could be provided in the risk rooms (Refer to Table 2 BS 5839 : Part 6) However, it appears that this method is complicated and less reliable and therefore it is unlikely that this type of protection will be encountered).

Risk analysis factors

- Risk in bedsit type accommodation is generally considered to be approximately 10 times higher than in other types of accommodation. (D.o.E. estimate)
- Detection should be installed in circulation spaces of all dwellings (clause 4.2 (a))
- 60% of deaths in HMOs occur in room where fire starts. (clause 4.2 (k))
- 50% of fatal fires start in living/dining rooms (clause 4.2 (l))
- 30% of fatal fires start in bedrooms (clause 4.2 (l))
- Greatest risk when occupant asleep (clause 4.2 (m))
- If no detector is installed in the room in which the fire starts, the time available for evacuation of other areas once the fire is detected... may be quite short (clause 7.2).
- If the risk is deemed to be high... LD2 system should be installed .....to protect reliably the occupant of a room where the fire originates ...LD2 system should be provided. (clause 8.2)

8.4.3 An FMO within a purpose built block of flats (Mansion Block)

Grade E system

- Mains wired smoke alarms
- Linked so that all sound when any one alarm is activated
- No stand-by power supply
- Wired to a single independent circuit at the dwelling's (i.e. flat's) main distribution board - no other equipment to be connected to this circuit other than a circuit monitoring device.

LD2 type coverage

- Smoke alarms sited in internal hallway/lobby of flat
- Smoke alarms sited in bedrooms and living rooms
- Heat alarms sited in kitchens

Risk analysis factors

- Risk in bedsit type accommodation is generally considered to be approximately 10 times higher than in other types of accommodation. (D.o.E. estimate)
- Detection should be installed in circulation spaces of all dwellings (clause 4.2 (a))
- 40% of fires start in kitchens (clause 4.2 (b))
- 60% of deaths in HMOs occur in room where fire starts. (clause 4.2 (k))
- 50% of fatal fires start in living/dining rooms (clause 4.2 (l))
- 30% of fatal fires start in bedrooms (clause 4.2 (l))
- Greatest risk when occupant asleep (clause 4.2 (m))
- If no detector is installed in the room in which the fire starts, the time available for evacuation of other areas once the fire is detected... may be quite short (clause 7.2).
- If the risk is deemed to be high... LD2 system should be installed .....to protect reliably the occupant of a room where the fire originates ...LD2 system should be provided. (clause 8.2)

The above is based on a standard risk premises. If it is clear that the FMO is subject to unusually high risk factors e.g. history of unreliability of common power supplies due to landlord's non-payment of bills, it may be appropriate to employ a higher grade of system.

9.0 DETECTORS/ALARMS

Detectors in AFD systems are designed to detect one or more of 3 characteristics of fire:

- Heat
- Smoke
- Radiation (flame) - NOT TO BE USED

9.1 Heat Detectors

There are two main types:

- Fixed Temperature - these are designed to operate when they reach a pre-selected threshold temperature.
- Rate of Rise - these are designed to operate when the temperature rises abnormally quickly. But they contain a fixed temperature element.

These then fall into two main categories:

- "Point type" - respond to temperature around a particular spot.
- "Line type" - respond to temperature change along a line of interconnected detectors or along a heat sensitive wire.

Normally "Point type" will be used.

Point heat detectors should comply with BS 5445 : Part 5 (Identical to EN 54 : Part 5) or in high temperature areas those conforming to BS 5445 : Part 8 (Identical to EN 54 : Part 8) should be used. Heat detectors conforming to BS 5445 : Part 5 or Part 8 always have a fixed temperature element, and may, additionally, contain a rate of rise element.

In order to avoid false alarms, the fixed operating temperature of a heat detector should be at least 20°C, but not more than 35°C above, the normal ambient temperature in the room.

The most suitable heat detector for a small domestic kitchen where there is likely to be a high ambient temperature is a fixed temperature type complying with BS 5445 : Part 8 whose fixed temperature element is set to approximately 90°C, depending on the manufacturer.

In bedsit type accommodation i.e. bedrooms containing a kitchen facility a type complying with BS 5445 Part 5 should be used which has a fixed temperature element set at approx. 60°C.

Heat detectors should not be sited directly over the oven

9.2 Smoke Detectors

There are two main types

- "Ionisation chamber smoke detectors" - these are based on the principle that an electric current flowing between electrodes in an ionisation chamber is reduced when smoke particles enter the chamber.

- "Optical smoke detectors"- these operate by detecting the scattering or absorption of light by smoke particles.

These then fall into two main categories:

- "Point" type which detect smoke at one position.
- "Beam" type which are effectively a "line" type as they detect smoke along a line.

Normally "Point type" will be used.

Point smoke detectors should comply with BS 5445 : Part 7 (Identical to EN 54 Part : 7)
Both ionisation and optical types have a sufficient range of sensitivity to be used for general fire risks. However the choice of detector should take into account the type of fire that may be expected and the need to avoid false alarms.

Ionisation type detectors may be more appropriate in living rooms or dining rooms where a fast burning fire is more likely to create a hazard to occupants than a smouldering fire. However, when certain materials, such as polyurethane foam, smoulder (when lit by a cigarette) they produce relatively large smoke particles to which ionisation detectors are comparatively insensitive. Conversely, false alarms may be caused by very dense tobacco smoke to which optical detectors are more sensitive than ionisation types. There is evidently no easy solution, however, the most common cause of false alarms in dwellings is smoke and other fumes from kitchens. Optical smoke detectors are less likely than ionisation types to respond to fumes from cooking and are therefore the most appropriate type to use near a kitchen facility.

In general, optical type detectors should be installed in ***circulation spaces***, such as stairs, hallways and landings. Optical detectors should also be installed in areas in which a likely cause of fire is ignition of furniture or bedding by a cigarette although there may be a problem of false alarms. Ionisation type detectors may be more appropriate in living rooms or dining rooms where a fast burning fire are more likely to create a hazard to occupants than a smouldering fire.

9.3 Choice of detectors for various rooms

Heat Detectors -	Kitchens. Kitchen area in bedsits. Boiler rooms.
Smoke Detectors -	Staircases. Corridors. Living rooms. Bedrooms. Stores

*Bedsitting rooms (i.e. with kitchen facilities) should contain a heat detector **AND** a non interlinked smoke alarm which should be mains wired and comply with BS 5446 : Part 1 : 1990. The non-interlinked smoke alarm should be wired so as to sound only in the room affected. The heat detector should be be wired to the main control panel to produce an alarm in all zones. The smoke alarm should be sited as far as possible from the cooking facility. (It is acknowledged that this arrangement is outside the scope of BS 5839 : Part 1 but is designed to ensure safety whilst minimising the likelihood of nuisance alarms).*

In bedsits containing a **separate** kitchen facility enclosed with a fire resisting construction careful consideration is required. If the kitchen area is very small and/or poorly ventilated false alarms may result from a standard L2 system when cooking is carried out with the kitchen door open - in such cases the arrangement in italics above may be appropriate. Larger kitchen areas with adequate ventilation will not usually pose a false alarm problem and the standard system should be installed.

9.4 Siting of detectors

The siting and spacing of detectors is of vital importance for an automatic fire detection system. The greatest concentration of smoke and heat will generally occur at the highest parts of the enclosed areas, and it is therefore here that detectors should normally be sited (i.e. on the ceiling).

- Heat detectors should be sited so that their sensitive elements are not less than 25mm and not more than 150mm below the ceiling.
- Smoke detectors should be not less than 25mm and not more than 600mm from the ceiling surface.
- Detectors should not be mounted less that 500mm from any walls or partitions

If the protected space is pitched, e.g. under a roof, they should be sited in the apex.

In staircases, detectors should be sited on every landing.

9.5 Spacing of detectors

9.5.1 Spacing under flat horizontal ceilings of rooms and corridors greater than 5m wide.

For open areas under flat horizontal ceilings, the horizontal distance from any point to the nearest detector should not exceed 5.3m for heat detectors or 7.5m for smoke detectors. This spacing will usually give a coverage of about 100m^2 per smoke detector and about 50m^2 per heat detector.

Heat Detector

Maximum distance covered is 5.3m radius i.e. the detector covers a circular area

For a square room this results in 3.5m to wall and 7m between detectors

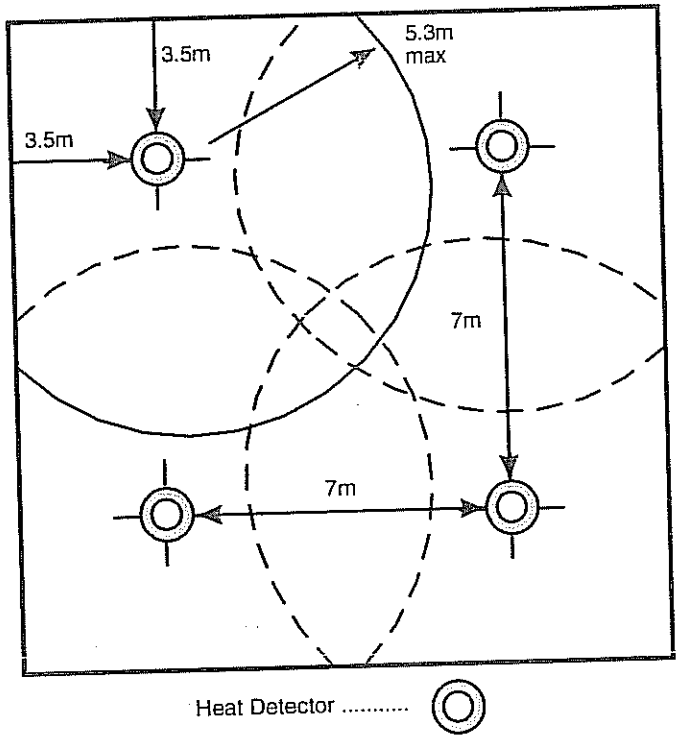

Figure 9.1 - Typical spacing of heat detectors in a square room

Smoke Detector

Maximum distance covered is 7.5m radius i.e. the detector covers a circular area

For a square layout this results in 5m to the wall and 10m between detectors

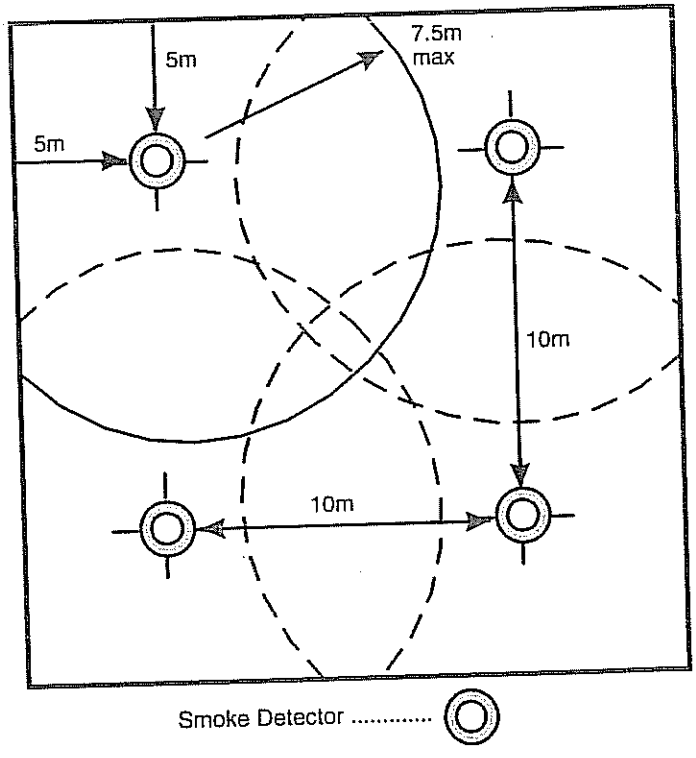

Figure 9.2 - Typical spacing of smoke detectors in a square room

9.5.2 Spacing in a corridor less than 5m wide

Add to the maximum horizontal distance stated in the previous paragraph (e.g. for smoke detectors 7.5m), 50% of the difference between 5m and the actual width of the corridor:

Example:

The max. horizontal distance covered by smoke detectors is 7.5m (paragraph 8.5.1)

In a corridor 2m wide.

Take the difference between 5m and the actual width (2m) = 3m

50 % of 3m = 1.5m

Therefore max distance between detectors is 7.5m + 1.5m = 9m

9.5.3 Spacing under a pitched ceiling or roof

Reference should be made to BS 5839 : Part 1 : 1988 clause 12.2.3 for the appropriate distance.

9.6 Obstructions

Where the passage of smoke or hot gas from a source to a detector is likely to be disturbed by a ceiling obstruction (such as a structural beam) having a depth greater than 150 mm but less than 10% of the height of the ceiling, the horizontal distance between detectors should be decreased by twice the depth of the obstruction.

Example:

The max. horizontal distance covered by smoke detectors is 7.5m (paragraph 8.5.1)

If the depth of the obstruction is 200mm (0.2m)

Then the maximum distance the detector can reach is 7.5m - (0.2m x 2) = 7.1m

- Where rooms are divided into sections by walls, partitions or storage racks reaching to within 300mm of the ceiling, the dividers should be treated as if they reach the ceiling.
- Where the ceiling obstruction is greater than 10% of the floor to ceiling height, then the areas either side of the obstruction are to be treated as separate rooms.
- Where the obstruction is less than 150mm it can be ignored.
- Placing detectors close or behind columns is not too detrimental provided that the spacing criteria is maintained.
- Detectors should not be mounted less that 500mm from any wall or partition.

9.7 Voids (unused empty spaces)

- Voids in excess of 800mm height are to be covered by detectors.

- Voids less than 800mm in height will not require detectors unless they present a risk of spread of fire between compartments or where extensive spread of fire can take place before detection. Suspended ceilings require care in this respect.

Detection is **not** a substitute for effective fire stopping (Section 5 - Fire Stopping)

9.8 Alarms

Smoke alarms should comply with BS 5446 : Part 1. Siting should be in accordance with individual manufacturer's specifications.

There is no current British Standard for heat alarms

10.0 AUDIBILITY

10.1 HMO's and FMO's

Clause 4.2 (m) - It is essential that AFD systems are capable of arousing occupants from normal sleep.

Clause 4.2 (k) - 60% of deaths in HMOs occur in the room where the fire starts.

Clause 4.2 (l) - 30% of fatal fires start in the bedrooms.

Clause 4.2 (i) - Risk in HMOs 8-10 times higher than in single family dwellings

Clause 12.2 - If an audible alarm is intended to arouse sleeping persons a sound level of 75dB(A) should be achieved at the bedhead with all the doors shut.

It is, therefore, recommended that 75dB(A) is required at the bedhead.

It should be noted that most fire doors will give an attenuation 20 - 30 dB(A), particularly as they will be provided with smoke seals. It is therefore unlikely that a sounder outside the room will provide the required sound level inside the room.

For rooms other bedrooms/sleeping rooms a level of 85dB(A) at the doorway with the door open will be required.

10.2 Single occupied self contained flats

Risk in bedsit type accommodation is generally considered to be approximately 8 - 10 times higher than in other types of accommodation. (D.o.E. estimate)

Standard of provision is Grade E

Alarms manufactured to BS 5446 : Part 1 will give an audibility of 85dB(A) at 3 metres. Fire doors will attenuate the sound between 20 & 30 dB(A). It is therefore impractical to achieve a higher level than 85dB(A) at the doorway with the door open.

11.0 CIRCUIT DESIGN (Grade A systems only)

11.1 Circuits Containing Fire Detectors

The wiring arrangement of the system should be such that a fault or faults in one zone or the removal of a detector in one zone cannot prevent the operation of the system in other zones in the building.
Further, if the system is such that the removal of a detector or call point from the circuit could affect the operation of other detectors, then the removal of that detector should cause a fault signal to be generated at the control equipment. This monitoring of detectors is normally achieved by arranging that the removal of a detector causes a break in the circuit, thereby breaking the monitoring current which normally flows through the "End of Line" resistor
If detectors are designed such that they can be removed (e.g. plug-in detectors) then the removal of any detector must not affect the operation of any of the manual call point. The simple monitoring system outlined above may not meet this requirement if manual call points are "down-stream" of the detectors. Special bases and monitoring circuits are normally required in such cases.

Note: Addressable systems have different circuit arrangements. Refer to paragraph 16.0 - zoning, for discussion on these types of systems.

11.2 Circuits Containing Fire Alarm Sounders

If the alarm sounders use the same wiring as the detectors i.e. sounders incorporated with the detector base (e.g. "*Squashnis*"), no alarm sounder must be affected by the removal of any detector.
In the event of an open or short circuit occurring in any wiring to the sounder circuit a minimum of 1 alarm sounder must continue to sound.

11.3 Compatibility

It is important to note that compliance of an individual component with a particular British Standard does not necessarily guarantee that it will work satisfactorily with another component complying with the same Standard. Therefore, where components of a particular installation are made by different manufacturers, it is essential that the compatibility of the components is taken into account in the design of the system.

12.0 POWER SUPPLIES

12.1 Grade A systems

Power supplies should conform to clause 16 of BS 5839 : Part 1 : 1988 (with the exception of 16.5 that relates to standby supplies) and is as follows :-

Normal supply to be from the standard mains AC power supply. Battery stand-by back-up to be provided to cover during failure of mains supply.

Arrangements for power supply to meet the following requirements :

- The system to be wired immediately to the dead side of the main isolating switch i.e. between the ellectricity supply company's meter and the property's main isolating switch (as wiring to the live side would result in an unmetered electrical supply to the alarm)
- Connection to mains via an isolating protective device (an isolating fuse switch or a circuit breaker) reserved solely for this purpose. Cable apparatus etc. to be fully in accordance with the current edition of the IEE Regulations

- Switch to be coloured red
- Switch to be labelled **"FIRE ALARM : DO NOT SWITCH OFF"**
- Switch to be secure from unauthorised operation - if in open area to be within a secure box with frangible cover (i.e. breakable by hand).
- Additional safety warning labels to be provided [1]
- Where residual current devices (circuit breakers) are provided, the system to be so wired that interruption of main building supply following a fault will not interrupt fire alarm supply

[1] **labelling** : If the alarm is fed from the live side of the main isolating switch for the property, a label on the **fire alarm isolating switch** to read in addition to *"fire alarm do not switch off"*, *"Warning , this supply remains live when the main switch is turned off"* and a label on the mains isolating switch stating *"Warning, the fire alarm supply remains live when this switch is turned off"*.
If wired to the dead side of the mains isolating switch a label to be affixed to the mains isolating switch stating *"Warning, this switch also controls the supply to the fire alarm system"*.
In practice the system will invariably be wired to the dead side of the mains isolating switch i.e. between the electricity supply company's meter and the property mains isolating switch (as wiring to the live side would result in unmetered electrical supply to the alarm).
Where electrical supply is via a coin-slot or pre-pay key meter, the alarm MUST be wired into the live side of the meter so that upon expiry of pre-paid time, the alarm continues to receive power. PRE-PAYMENT ARRANGEMENTS FOR FINITE AMOUNTS OF POWER SUPPLY TO ALARM ARE NOT PERMITTED UNDER ANY CIRCUMSTANCES.

12.1.1 Stand-by supply

The standby supply should be capable of automatically maintaining the system in normal operation (but giving an audible and visual indication of mains failure) for a period of 72 hours after which sufficient capacity should remain to supply the maximum alarm load for at least 15 mins.
Note: It is likely that the number/size of the batteries, to provide 72 hour standby supply, will result in the need for them to be stored in a separate compartment from the control panel. Refer to paragraph 13.0 "Cables and Wiring" for details of acceptable types of wiring and its protection.

12.1.2 Siting of power supplies

Mains power switch to be secure from unauthorised operation, if in open area to be within a secure box with frangible cover. Batteries in the smaller AFD systems likely to be encountered in HMOs will usually be of a sealed type and be located within the panel of the Control Equipment. In the unlikely event of larger systems with non-sealed batteries being encountered consult clause 16.7 of BS 5839 : Part 1 : 1988.

12.2 Grade B systems (not relevant to this guide)

12.3 Grade C systems (not relevant to this guide)

12.4 Grade D systems

The mains supply and wiring between alarms may comprise of any cable suitable for domestic mains wiring. The mains supply should take the form of either :

- An independent circuit at the dwelling's i.e. house's main distribution board, in which case no other electrical equipment

should be connected to this circuit other than a circuit monitoring device.
It is reccomended that the mains power supply incorporates a circuit monitoring device either dedicated to the circuit or preferably at each detector.

OR

- A separately electrically protected, regularly used lighting circuit.

The mains supply is to be backed up by a standby supply (generally within the alarm body) which should be a secondary battery with an automatic charger. The battery should be of a type that has an expected life of 4 years The standby supply should be capable of automatically maintaining the system in normal operation (but giving an audible and visual indication of mains failure) for a period of 72 hours after which sufficient capacity should remain to supply the maximum alarm load for at least 4 mins.
An audible warning should be given at least once every minute if the capacity of the standby supply falls below that required to provide the recommended standby duration. In the event of mains failure the audible warning should persist for 15 days, unless a visual indication is given at the smoke alarm (e.g. extinguishment of a normally illuminated indicator) in which case the audible warning need persist for only 72 hours.

12.5 Grade E systems

The mains supply and wiring between detectors may comprise of any cable suitable for domestic mains wiring. The mains supply should take the form of an independent circuit at the dwelling's i.e. house's main distribution board. No other electrical equipment should be connected to this circuit other than a circuit monitoring device. It is reccomended that a circuit monitoring device either dedicated to the circuit or preferably at each detector is provided.

The mains supply should not be connected to the lighting circuit as no standby supply is incorporated in Grade E systems.

Grade E systems should preferably incorporate a dedicated visual and/or audible means of indicating mains failure.

The circuit serving the smoke alarms should preferably not be protected by any residual current device (r.c.d). If a r.c.d. is required for safety reasons, either of the following conditions should apply :

- The r.c.d. should serve only the circuit supplying the smoke alarms.

- The r.c.d. protection of a fire alarm circuit should operate independently of an r.c.d protection for circuits supplying socket outlets or portable equipment.

12.6 Grade F systems (not relevant to this guide)

13.0 CABLES AND WIRING

A developing fire in a building will progressively destroy the building contents and structure including wiring to the AFD system. The cables must therefore resist the fire and it's effects for a period long enough to ensure the intended function of the system i.e. in HMOs to warn occupiers of fire early enough and for long enough to allow their escape.

13.1 Grade A systems

All wiring should conform to recommendations of clause 17 of BS 5839 : Part 1 : 1988 which is as follows:-

13.1.1 Two types of cable function exist within the AFD system :

A : cables required to continue to function during a fire ("*prolonged operation in a fire*")

B : cables which having served their purpose can fail without detriment ("*not requiring prolonged operation in a fire*")

Situation A : (*prolonged operation.....)*

- All cables between the control equipment and sounders. This is to ensure signals and power continue to pass from the Control Equipment to the sounders enabling the alarm signal to continue to be given for a considerable period into the fire.
- All cables between the control panel and the main fuse switch (paragraph 10.0). This is not a requirement of BS 5839, however it is strongly recommended as good practice.
- All cables between the control panel and the compartment housing the standby batteries.

Situation B : (*not...prolonged operation.....)*

- The link from detectors and call points to the panel. The detectors and call points are essentially triggers. Once they have triggered the panel to sound they can fail as the panel will continue to instruct the sounders to operate.
- The link from the panel to automatic door release units (magnetic door holders). This can fail at an early stage as failure merely closes the fire doors which may be beneficial.

It is important to note that all cabling must be protected from physical damage e.g. impact, rodent attack

13.1.2 System for the assessment of cables :

BS 6387 details the testing procedure for cables and lays down classifications when tested under 3 categories:

- Resistance to fire alone - ratings A,B,C or S depending on performance
- Resistance to fire with water - rating W when test satisfied
- Resistance to fire with mechanical shock - ratings X, Y or Z depending on performance

The classification required for cables in **Situation A** above *(prolonged operation.....)* is CWZ, meaning .....

- "C" : resistance to fire @ 950°C for 3 hours
- "W" : resistance to fire with water
- "Z" : resistance to fire @ 950°C with mechanical shock

Explanatory note :

BS 5839 : Part 1 requires cables in this situation to comply with AWX or SWX. This is a lower standard than the CWZ rating recommended in this Guide. The reasons are as follows :

- Building Regulations 1991, Approved Document B requires CWZ rating
- NICEIC recommend CWZ rating (Newsletter 108, December 1993)
- The Cable Industry is now manufacturing and testing to CWZ rating as a matter of course

Cables are assessed by a ***UKAS registered testing house*** such as *British Approvals Service For Cables (BASEC).*

13.1.3 Types of cabling which comply :

For use in **Situation A** above (*prolonged operation....*) :

- Cables with a CWZ rating are required
- All must be protected from mechanical damage e.g. impact and rodent attack

The following examples of proprietary cables are currently available which meet these requirements :-

- Mineral Insulated Copper Covered Sheathed Cables (often termed *MICC* or "*Pyro*"): - acceptable *unprotected* in all situations.
- AEI *"Firetec"* range with its own approved fixings and termination glands - acceptable in all locations subject to conditions (i) to (v) below
- Delta Special Cables Ltd, *"Firetuf OHLS"* Cable with it's own approved fixings and termination glands - acceptable in all locations subject to conditions (i) to (v) below
- Datwyler (UK) Ltd *"Lifeline"* Cable with it's own approved fixings and termination glands - acceptable in all locations subject to conditions (i) to (v) below
- Draka Calflex Cable, *"Calflam"* - acceptable in all locations subject to conditions (i) to (v) below.
- Huber and Suhner A.G., *"Radox FR"* cable - acceptable in all locations subject to conditions (i) to (v) below
- Pirelli *"FP200 Gold"* - acceptable in all locations subject to conditions (i) to (v) below.

Conditions:

(i) To be protected against rodents

(ii) Surface run cables to be protected against mechanical damage to a height of 2.25m from finished floor level

(iii) Cables installed within wall should ideally be protected by metal conduit or metal capping but alternatively by rigid PVC conduit (complying to BS 6099) or non-metallic trunking/ducting (complying to BS 4678 : Part 4).

(iv) Fixing of surface run cables by means of approved clips and the number of fixings and formed radius bends to comply with the current edition of the IEE Regulations and manufacturer's recommendations.

(v) Type of glands to be as specified by manufacturer for use with CWZ rated cables.

For use in **Situation B** above (*not .....prolonged operation....*):

Non-specific cables e.g. PVC insulated twin and earth may be used subject to protection from physical damage and rodent attack (i.e. conditions (i) to (iv) above)

Twin and earth cables are available in LSZH (low smoke zero halogen) constructions. Whilst not a current requirement, these types are recommended as good practice.

13.1.4 Additional recommendations for installation of cabling:

MICC may be installed in all locations without additional protection

Other cable types listed above to be installed with the following recommendations

- Routed as far as possible in areas of lower fire risk
- Conduits, trunking, channels used for fire alarm cabling to be exclusively reserved for this purpose
- Conduits, ducts and trunking used for fire alarm cabling to be marked as such and the cabling to be completely enclosed when covers are in place
- Where conduits, ducts and trunking passes through floors, partitions etc., attention must be paid to fire stopping between the compartments (Section 5 - Fire Stopping)
- All joints except those within detectors, call points etc., to be enclosed in suitable junction boxes labelled "*fire alarm*".

13.2 Grade B systems (not relevant to this guide)

13.3 Grade C systems (not relevant to this guide)

13.4 Grade D and E systems

The electrical wiring should conform to the recommendations laid down in current edition of the IEE Regulations.

Since the wiring is unmonitored, the cable should be protected against mechanical damage by impact, abrasion or rodent attack

13.5 Grade F systems (not relevant to this guide)

14.0 CONTROL AND INDICATING EQUIPMENT (GRADE A SYSTEMS ONLY)

Grade A systems incorporate equipment for the reception, indication, control and relaying of signals originating from fire detectors or manual call points connected to them and for the activation of alarm sounders and alarm signalling devices.
Control and indicating equipment for Grade A systems should comply with BS 5839 : Part 4. This is a technical standard relating to design, functioning, durability, testing and safety of the control equipment. It is not necessary to know the details. **Control equipment must be marked on its front panel as complying with BS 5839 : Part 4 : 1988.**

For completeness and greater understanding, details of the relevant points contained in BS 5839 : Part 4 are included in Section 8 - Fire Detection and Alarm systems for Hotels and Hostels paragraph 12.0. A summary follows in paragraph 14.1.

14.1 Basic requirements

The Control Equipment must ..

- Activate the alarm sounders when detectors/call-points signal fire situation
- Give a visible indication of the alarm state on the panel
- Operate a further control sounder within or adjacent to the panel
- Indicate within which zone the activated detector or call-point is located by means of a numbered list **and** for complex layouts a plan of the building
- Include manual silencing and re-set switches (automatic silencing/re-set not permitted following alarm situation)
- Include a switch for sounding alarm regardless of detector/ call-point activation
- Give an audible sounder at the panel of the presence of faults in the system (fault re-set may be automatic)
- Give a visible indication at the panel of the presence of faults in the system (fault re-set may be automatic)
- Be marked on the front panel as complying with BS 5839 : Part 4 : 1988
- Be marked on the front panel with the manufacturer's or supplier's name and the model/type number of the equipment

Note: Control panels often require the insertion of a key to enable use of any of the controls. Where this is the case a key must be retained on site by the ***Responsible Person.***

14.2 Siting of control equipment

The Control equipment is primarily for the use of the occupier of the building (i.e. the ***Responsible Person***) and the fire brigade in the event of an emergency call out. It should be sited to meet the following requirements :

- Readily accessible at a suitable height (i.e. reached without ladder or chair)
- Readily accessible to building occupiers ie the ***Responsible Person***
- Immediately accessible to fire brigade on entry to the building
- In area of low fire risk to ensure alarm is given before equipment damaged by fire
- In an area covered by automatic detectors linked to the system
- Operating instructions to be displayed near the equipment
- Adequate ambient light level near the panel[2] to ensure all indications (not just the illuminated indicators) are easily legible at all hours)
- Out of direct sunlight or illuminated indicators may not be visible
- In a position where the ambient sound level does not prevent audible signals from the panel being heard

The most suitable location in HMOs is the ground floor common hallway just inside the main entrance door.

If there is more than one entrance a ***repeater indicator panel*** is to be sited just inside each main entrance other than the one where the main panel is sited.

[2] additional lighting may be provided to ensure this requirement. If powered from the fire alarm supply then in the event of a mains power failure it must only light during a fire condition (to prevent unnecessary drain on the standby supply) and the additional power load must be calculated at the system design stage. However, an emergency lighting luminaire will be provided above the panel to comply with BS 5266 (Section 10 - Ordinary and Emergency Staircase Lighting)

15.0 MANUAL CALL POINTS (GRADE A SYSTEMS ONLY)

- Must comply with BS 5839 : Part 2 : 1988
  - Must be of uniform type throughout the premises
  - Break glass call points should be sited on exit routes and in particular on landings of staircases and at all exits to the open air.
  - No person should have to travel further than 30m to reach a call point.
  - Generally call points should be fixed at a height of 1.4m above the floor.
  - To be sited in areas easily accessible, well illuminated and in conspicuous positions free from obstructions.
  - They may be flush mounted in locations where they will be readily seen. But, where they are viewed from the side e.g. in corridors they should be surface mounted in order to present a side profile area of at least 750mm^2.

16.0 ZONES

16.1 Grade A systems

In order to ensure a fast and unambiguous identification of fire source, these systems should be sub divided into zones in accordance with BS 5839 : Part 1 as follows:

- If the total floor area of the building is not greater than 300m^2, then the building need only be one zone, even though it may contain more than 1 floor.
- The total floor area for a zone should not exceed 2000m^2.
- The search distance i.e. the distance that has to be travelled by a searcher inside the zone in order to determine visually the position of the fire, should not exceed 30m.
- Generally, if the building exceeds 300m^2, then each zone should be restricted to a single storey and the staircase enclosure should form a separate zone.

Remote indicator lamps outside doors, etc. may be helpful, especially if doors are likely to be locked as they make the search of the area easier. However, they cannot be required by a Section 352 notice.

Addressable systems identify the specific detector or call point that has been activated or is defective. They are therefore very useful in identifying the source

of the fire or component defect. These cannot be required in Section 352 notices but it is good practice to provide them in the larger HMOs. For the reasons above addressable systems are currently uncommon and the control panel will usually only indicate which zone has been activated.

16.2 Other grades

Zoning will not be applicable if the reccomendations of this Guide is followed.

17.0 INSTALLATION

17.1 Grade A systems

These should be installed in accordance with Section 3 of BS 5839 : Part 1.

17.1.1 Commissioning a newly installed system

On completion of the installation the person responsible should be supplied with adequate instructions on its use, routine attention and test procedures. Wiring diagrams of the system would be included and should be kept up to date and available for reference.

The installer should supply the user with a ***log book*** and ***a certificate of installation and commissioning.*** (Model forms - paragraph 22.0) The certificate should certify that the installation complies with recommendations in BS 5839 : Part 6. If any deviations have been agreed, a statement of these deviations should be given by the installer.

17.1.2 The commissioning test

The system should be tested to ensure that it operates satisfactorily and that in particular:-

- The alarm devices comply with the recommendations of clause 9 in BS 5839 : Part 1 for audibility.
- All detectors and manual call points function correctly and initiate the correct operation.
- Any connection to the fire brigade or remote manned centre operates correctly.
- Any radio links have adequate signal strength (see clause 18.4 in BS 5839).
- Any signals to supplementary equipment are given correctly.

17.1.3 Handover

When commissioning and certification are complete, the system should be formally handed over to the user.

17.1.4 Extensions and alterations to an existing system

If the work is an extension of an existing installation, the existing equipment should be thoroughly tested to ensure that it will function satisfactorily in conjunction with the new equipment.

17.1.5 Action required by inspecting officer

The Case officer should :

- Witness the commissioning test,
- Test a sample of the detectors and call points
- Test audibility levels in a selection of rooms using a sound level meter. (paragraph 10)
- Check main power supply source (paragraph 12.1)

However, a detailed inspection is not recommended as the commissioning certificate must be relied upon to prove that the system has been installed to BS 5839 : Part 6.

17.2 Grade D and E systems

These should be installed generally in accordance with the current edition IEE Regulations by a ***Competent Person.***

18.0 CERTIFICATION

The installer should certify that the installation conforms to the recommendations of this Part of BS 5839 for the relevant grade and type of system (model - paragraph 21.1)

19.0 USER INSTRUCTIONS

The supplier of the system should provide the owner of the HMO with written information on the following:

- Operation of the system
- Action in the event of a fire alarm signal.
- Avoidance of false alarms.
- Action in the event of a false alarm.
- Routine testing of the system.
- Servicing and maintenance of the system. (include intervals at which batteries should be replaced.
- The need to keep a clear space around all detectors and manual call points.
- Special precautions to be taken if lithium batteries are used.
- Checking the system on reoccupation of the dwelling after a vacation etc.
- The need to prevent contamination of detectors by paint

Guidance should be given to the user concerning common causes of false alarms and their avoidance

20.0 ROUTINETESTING

20.1 Grade A systems

These should be tested in accordance with BS 5839 Part 1. clause 29.2.4

At least one detector or call point in each zone should be tested to ensure correct operation of the system. Any defect should be recorded in the ***log book*** and action taken to correct it.

20.2 Grade D and E systems

These systems should be tested **every month** by operating all the alarm sounders in the dwelling. This can be done by use of the test button on the smoke alarm

All detectors should be tested at least once every year to ensure that they respond to smoke. Tests should not involve the use of open flame or any form of smoke or aerosol that could contaminate the detection chamber or the electronics of the detector. Suitable test aerosols are available.

21.0 SERVICING AND MAINTENANCE

21.1 Grade A should be tested in accordance with BS 5839 : Part 1

Inspections and tests should be carried at the following intervals :

- Daily (21.1.1)
- Weekly (21.1.2)
- Monthly (21.1.3)
- Quarterly (21.1.4)
- Annually (21.1.5)
- Every five years (21.1.6)

The daily, weekly, and mionthly tests can be carried out by the ***Responsible Person*** appointed by the user

The quarterly, annual and five - yearly test must be carried out by a ***Competent Person***

21.1.1 Daily

Ideally a check should be made each day that the control panel indicates normal operation and that any fault warning from the previous day has received attention.

21.1.2 Weekly

At least one detector or call point in each zone should be tested to ensure correct operation of the system. Any defect should be recorded in the log book and action taken to correct it.

21.1.3 Monthly

If an emergency generator is used in the system, it should be started up every month by a simulation of a power failure. (See clause 29.2.5 of BS 5839 : Part 1 for further details of tests for large systems).

21.1.4 Quarterly

The ***Responsible Pperson*** should ensure that every three months the following check is made by a ***Competent Person:-***

(The HSE definition of a ***Competent Person*** is: "*A person trained and experienced so as to be able to properly examine, test and undertake any appropriate remedial action and to present the information in a report).*

- Entries in the log book should be checked and any necessary action taken.
- Batteries and their connections should be tested to ensure their good condition.
- At least one detector or call point in each zone should be activated to ensure the correct functioning of the system. All fault indicators and their circuits should be checked, preferably by simulation of fault conditions.

- A visual inspection should be made to check whether structural or occupancy changes have affected the requirements for the siting of manual call points, detectors or sounders.
- All further tests recommended by the installer, supplier or manufacturer.

Upon completion of the work a ***certificate of testing*** should be issued to the ***Responsible Person***. (Model - paragraph 22.2)

21.1.5 Annual test

Annually, the quarterly tests detailed paragraph 21.1.4 should be carried out. In addition, each detector should be checked individually for correct operation in accordance with manufacturers recommendations and a visual inspection should be made to confirm that all cable fittings and equipment are secure, undamaged and adequately protected. A ***certificate of testing*** should be issued to the ***Responsible Person***. (Model - paragraph 22.2)

21.1.6 Every five years

The ***Responsible Person*** should ensure that the installation is tested in accordance with the testing and inspection requirements of the current edition of the IEE Regulations. A ***periodic test certificate*** should be issued to that person.

A certiicate of testing under this British Standard should also be issued. (Model - paragraph 22.2)

21.1.7 Action after a fire

The ***Responsible Person*** should ensure that the following action is carried out as soon as possible after any fire:

- Each detector/call point to be tested
- Each sounder to be tested
- A visual examination to be made of any other part of the system which might have been damaged
- Any defect found to be recorded in the ***log book*** and immediate action taken to correct the defect
- The servicing company to be informed of the fire and instructed to carry out a check of the system
- On completion of the above a ***certificate of testing*** should be issued to the ***Responsible Person***. (Model - paragraph 22.2)
- Records to be updated in respect of any changes to the system

21.1.8 Action after a false alarm

The ***Responsible Person*** should ensure that the following action is carried out as soon as possible after any false alarm :

- Identify the detector or call point which initiated the alarm.
- Establish the cause of the false alarm.
- Reset the system and check that it is functioning correctly.
- Record in the log book and inform organisation responsible for servicing.

If there are repeated false alarms, the servicing organisation should investigate (paragraph 21.1.12)

21.1.9 Prolonged periods of disconnection

If the system is disconnected for a long period, for example if the property is left vacant, on reconnection it should be re-tested as for the annual inspection.

21.1.10 Non routine attention

The system may require further attention after:-

- Extensions or alterations to the premises.
- Changes in occupancy or activities in the area covered by the system.
- Changes in the ambient noise level or sound attenuation such as to change the sounder requirements.
- Damage to the installation even though no fault may be immediately apparent.
- Any change to ancillary equipment.

21.1.11 Maintenance Of Detectors

Smoke detectors

Care should be taken to ensure that the sensitivity of smoke detectors is maintained. Accumulation of dirt and dust can adversely affect the sensitivity and if the detectors are found to be accumulating dust, they should be checked more frequently.

Heat detectors

The sensitivity of heat detectors can be affected by them being painted over or damaged so they should be inspected visually frequently. 2% should be tested with a heat source annually and if they fail to operate properly, the cause should be investigated and steps taken to ensure that other detectors are not affected in the same way.

21.1.12 False And Unwanted Alarms (Nuisance Alarms)

Many false alarms are caused by activities in the vicinity of detectors. The ***responsible person*** should ensure that all persons in the building are aware of the automatic fire detection system. Anyone working in the building should also be made aware of the system so that false alarms are not generated.
The average rate of false alarms from an installation should not exceed one false alarm per year for every ten detectors. The number of false alarms from an individual detector should not exceed one false alarm every two years. If there are repeated false alarms, the servicing organisation should investigate.

Possible remedies include :

- Adjusting sensitivity of detector(s) affected
- Changing type of detector e.g. optical to ionisation
- Re-siting detectors
- Clean detector heads and/or general environment providing better ventilation
- Eliminate draughts

21.2 Grade D & E smoke alarms

The alarms should be cleaned periodically in accordance with manufacturer's instructions.

Accumulation of dirt and dust can adversely affect the sensitivity and if the alarms are found to be accumulating dust, they should be checked more frequently.

22.0 MODEL CERTIFICATES AND LOG BOOK

22.1 Model Installation Certificate

Model Installation Certificate for Part 6 Systems

Certificate of Installation and Commissioning of the Fire Alarm and Detection System at :

Address .....

.....

.....

It is certified that the fire detection and alarm system at the above address conforms to the recommendations of BS 5839 : Part 6 for a type ....., grade .....system, other than in respect of the following deviations :

The entire system has been tested for satisfactory operation.

Instructions in accordance with the recommendations of clause 22 of BS 5839 : Part 6 have been supplied to :

.....

Signed..... Date .....

For and on behalf of .....

22.2 Model certificate of testing of a fire alarm system.

Certificate of testing of a fire alarm system at :

Protected area :..

Address:...

....

- -

The system is operational and has been checked and tested in accordance with BS 5839 : Part 1: 1988:

* clause **27** Extensions and alterations to existing system

* subclause **29.2.6** Quarterly inspection and test

* subclause **29.2.7** Annual inspection and test

* subclause **29.2.8** Wiring check

* subclause **29.3.2** Servicing after a fire

* subclause **29.3.3** Servicing following a false alarm

* subclause **29.3.3** Servicing following excessive false alarms

* subclause **29.3.4** Servicing following a fault

* subclause **29.3.5** Servicing following a pre-alarm warning

* subclause **29.3.7** Other non-routine attention specify..

....

* delete if not applicable

Signed .... Status...

Date...........................

For and on behalf of (user or service organisation)...

....

NOTE: The above model certificate has been extracted fron BS 5839 : Part 1 as no model certificate is provided in Part 6. Therefore the clauses and sub-clauses quoted within it are from Part 1.

22.3 Model log book

Log book

Foreword
It is recommended that this log book is maintained by a responsible executive who should ensure that every entry is properly recorded. An "event" should include fire alarms (whether real or false), faults, pre-alarm warnings, tests, temporary disconnection's and the dates of installing or servicing engineer's visits with a brief note of work carried out and outstanding.

Reference data

Name and address .....
.....

Responsible person .....Date.....

.....Date.....

.....Date.....

.....Date.....

The system was installed by .....

and is maintained under contract by .....until.....
Telephone number .....who should be contacted if service is required

Event Data

Date	Time	Counter reading*	Event Action Required	Date completed	Initials

.....

Expendable component replacement due (list) : .....
.....
.....

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A NATIONAL COMPANY WITH LOCAL CONNECTIONS

For information and advice
freephone 0800 160 160

Head Office :
4 Vaughan Way,
Leicester.
LE1 4ST

Suffolk Lodge,
Wingfield Road,
Stratford,
London.
E15 1LW

84 Barden Road,
Tonbridge,
Kent.
TN9 1BU

ORDINARY AND EMERGENCY STAIRCASE LIGHTING

1.0 ORDINARY STAIRCASE LIGHTING

Adequate conventional lighting must be provided throughout the entire escape route (i.e. staircases, landings etc.) to a place of safety. Light switches (or "push buttons") shall be provided on each landing providing access to a room(s). They shall be wired so that the use of any one switch/push button along the route illuminates the entire escape route.
If a push button system is installed it must be designed so that the staircase is illuminated for a minimum of 4 minutes.
It is recommended that in order to deter the theft of light bulbs a different type of bulb holder is used from the type used in the rooms e.g. one that accepts screw type bulbs

2.0 EMERGENCY STAIRCASE LIGHTING

Emergency lighting is designed to automatically illuminate the escape route (i.e. staircases, landings etc.) upon failure of the supply to the normal artificial lighting. The Emergency Lighting installation must comply with BS 5266 : Part 1 : 1988.

If the supply to the normal lighting fails, emergency lighting must:

- Illuminate the escape route to assist the occupants to move easily towards exits and a place of safety.
- Enable easy identification of fire alarm call points and fire fighting equipment throughout the escape route.

Emergency lighting must operate not only when there is a complete failure of the supply to the normal artificial lighting but when there is a localised failure that could be hazardous.

2.1 Illumination

To comply with BS 5266, the horizontal illuminance at floor level on the centre line of a defined route should not be less than 0.2 lux. In addition, on escape routes up to 2m wide 50% of the route width should be lit to a minimum of 0.1 lux.
Note: a prevalence of higher risk groups e.g. elderly persons may warrant a higher level of illuminance.

Draft European Standard EN 1838 proposes an increase in illuminance in certain situations. It has not yet been adopted in the U.K.

BS 5266 outlines a method of measuring illuminance.

2.2 ResponseTime

In hotels and other premises which are occupied by persons who could be unfamiliar with the layout the emergency lighting should be provided within 5 seconds of the failure of normal lighting supply. In all other premises this time can be extended to 15 seconds.

2.3 Emergency Lighting Design

2.3.1 Failure of normal supply to the premises

If the normal staircase lighting is wired on separate floor by floor circuits then only the luminaire(s) on the failed floor area need illuminate (because the other floor(s) will be normally lit). If the normal staircase lighting is on one dedicated circuit then a failure of that circuit must light all the luminaires throughout the entire staircase/escape route. However it should be noted that that if the recommendations for the normal staircase lighting set out in paragraph 1.0 are followed then a dedicated circuit for the staircase will have been installed i.e. the lighting circuit will have been wired so that the use of any one switch/push button along the route will illuminate the entire escape route

2.3.2 Mounting height of luminaires

The mounting height of luminaires will be governed by the physical characteristics of the area. They should be mounted as low as possible, but at least 2m above floor level measured to the underside of the luminaire.

2.3.3 Siting of luminaires

Luminaires should be sited in the following positions :

- Near each intersection of corridors;
- At each exit door;
- Near each change of direction (other than on a staircase);
- Near each staircase so that each flight of stairs receives direct light;
- Near any change of floor level;
- Outside each final exit and close to it,[1]
- Near each fire alarm call point;
- Near fire fighting equipment;
- To illuminate exit and safety signs required by the enforcing authority.

[1]This is not required unless it is outside a secondary escape route or where the normal street lighting is inadequate.

"Near" is normally considered to be within 2 metres measured horizontally.

The route should be reasonably uniformly lit.

2.3.4 Escape Lighting Luminaires

2 types:

- **Self Contained**
  These units contain their own battery charger, control gear and lamp so that in the event of a mains supply failure the light will operate for its rated duration.

- **Slave**
  These units do not contain their own batteries. They are designed to operate using a central battery system or prime mover generator.

Both types must comply with BS 4533 Clause 102.22.

Self contained luminaires will be the most commonly used in HMOs because they are cheap and easy to install. If "Slave" type luminaires are to be used reference must be made to BS 5266 particularly with respect to the need to protect wiring.

2.3.5 Mode of Operation

Self contained luminaires operate in one of 2 different modes:

- **Non maintained**
  In this mode of operation the emergency lamp is off when the mains supply is healthy. When the mains supply fails the lamp is then illuminated from its own battery and control gear. Restoration of the mains supply switches the lamp off and automatically recharges the battery ready for the next failure.

  Sustained luminaires are a particular type of non-maintained unit. This type contains 2 lamps, one lamp operates when the mains supply is healthy and a different lamp is illuminated when the mains supply fails.

- **Maintained**
  This mode of operation works in the same way as the non-maintained unit but, in addition, the lamp may be illuminated when the mains supply is healthy. To provide the power for this a separate connection has to be made, this supply can be switched if required. If the mains supply fails, its own battery supplies the lamp like the non-maintained units.

N.B. Charging monitor - All luminaires must contain an indicator (often a red LED) which is illuminated and shows that the mains supply is healthy and the battery is charging.

Minimum required battery design life is 4 years, batteries should be changed after this period of operation even though in practice they may continue to function for longer.

2.3.6 Categories

Self contained luminaires are normally designed to provide lighting for a period of 1 to 3 hours after the mains supply has failed.

Emergency lighting systems are categorised in the following way:

M = Maintained - followed by the number of hours the lighting is designed to operate.

NM = Non-Maintained - followed by the number of hours the lighting is designed to operate.

e.g. NM/3 = A non maintained system designed to operate for 3 hours after the failure of the mains supply.

2.4 Choice of Appropriate Emergency Lighting Systems

2.4.1 Where to require emergency lighting

Emergency lighting is not required in 1 and 2 storey HMOs unless they are large and/or have complicated layouts.

Emergency lighting is strongly recommended in all other HMOs.

2.4.2 Duration

The time for which escape lighting is designed to operate will always be longer than the minimum time to evacuate the premises, in case people are cut off, injured etc. Further, time must be allowed for an adequate search of the premises to be carried out.

It shall be designed to operate for 3 hours after the failure of the mains supply.

2.4.3 Wiring

The wiring to the emergency luminaires should be in accordance with the current edition of the IEE Regulations.

The electrical supply for self-contained luminaires should be taken from the un-switched local light source and be of a similar type to that used for the normal mains (staircase) lighting. In the event of fire, if the cabling used for the emergency luminaires has greater protection, there may be a chance of the normal lighting failing and the emergency lighting remaining at normal mode (i.e. inoperative). Hence it is recommended that self-contained emergency luminaires are wired in PVC insulated cable.

The supply to self contained luminaries should be designed to prevent unauthorised disconnection, but it must incorporate a suitable means for simulating a mains failure (i.e. test switch).

The source of the supply should be from the same local fuse as the normal (staircase) lighting so that, in the event of fuse failure causing normal lighting to be extinguished, the emergency lighting is brought into operation in the same locality.

NB : If luminaires are not self-contained, the wiring to the central battery back-up or prime mover generator will need to be BASEC approved CWZ as required in AFD wiring (refer to BS 5266 for details).

2.5 Certificate and Log Book

2.5.1 Completion Certificate

On completion of the work of installing an emergency lighting system or part thereof, or major alteration to the existing system, a ***completion certificate,*** (model - paragraph 3.1), should be supplied to owner of the premises.

2.5.2 Periodic inspection and test certificate

On completion of a three-yearly inspection and test, a ***periodic inspection and test certificate,*** (model - paragraph 3.2), should be supplied to the owner. This certificate should be supplied at intervals of not more than 3 years or on the completion of a major alteration or addition to an existing installation.

2.5.3 Log book

A log book should be kept on the premises in the care of the ***Responsible Person*** appointed by the owner and must be readily available for examination by a duly authorised person.

The Log book should record:

- Date of completion certificate including any certificate relating to alterations;
- Date of each periodic inspection and test certificate;
- Date and brief details of each service, inspection and test carried out;
- Date and brief details of any defects and of remedial action taken;
- Date and brief details of any alteration to the installation.

2.5.4 Supervision

Regular servicing is essential and the owner or the person managing the premises should appoint a ***Competent Person*** to supervise the system. He/she should be given sufficient authority to ensure correct operation and maintenance of the system.

The HSE definition of a ***Competent Person*** is:-

"A person trained and experienced so as to be able to properly examine, test and undertake any appropriate remedial action and to present the information in a report."

The ***Competent Person*** in this context should be a suitably qualified electrical engineer i.e.

- A member of the Electrical Contractor's Association (ECA) or,
- A member of the National Inspection Council for Electrical Installation Contracting (NICEIC) or,
- An authorised representative of a manufacturer of emergency lighting equipment.

2.6 Routine Inspection and Testing

This is for self contained systems only. Further checks will need to be made for central systems (Using slave luminaires). Reference should be made to BS 5266 for the additional checks.

Tests should wherever possible be carried out at times of minimum risk.

Inspections and tests should be carried out at the following intervals.

- Daily. (2.6.1)
- Monthly. (2.6.2)
- Six-monthly. (2.6.3)
- Three-yearly. (2.6.4)
- Subsequent annual test. (2.6.5)

The daily, monthly and six-monthly test can be carried out by any ***Responsible Person*** appointed by the owner or person managing the premises.

The three-yearly and subsequent annual test must be carried out by a ***Competent Person.***

2.6.1 Daily

An inspection should be carried out every day to ascertain that:

- Any fault recorded in the log book has been given urgent attention and the action noted.
- Every lamp in a maintained system is illuminated.
- Any fault found is recorded in the log book and the action taken recorded.

2.6.2 Monthly

An inspection should be carried out at monthly intervals in accordance with a systematic schedule. A model schedule is illustrated in paragraph 3.3.

Tests should be carried out as follows:

Each luminaire and internally illuminated exit sign should be energised from its battery by simulation of a failure of the mains supply to the normal lighting for a period only to ensure that each lamp is illuminated.

The period of simulated failure should not exceed ¼ of the rated duration of the luminaire or exit sign.

During this period all luminaires and/or exit signs should be examined visually to ensure they are functioning correctly.

At the end of the test period the supply to the normal lighting should be restored and any indicator lamp or device checked to ensure that it is showing that the normal supply has been restored.

2.6.3 Six-monthly

The monthly inspection should be carried out together with the following additional tests :

Each 3 hour luminaire and internally illuminated exit sign should be energised from its battery for a continuous period of 1 hour, by simulation of a failure of the supply to the normal lighting.

During this period all luminaires and/or exit signs should be examined visually to ensure they are functioning correctly.

At the end of the test period the supply to the normal lighting should be restored and any indicator lamp or device checked to ensure that it is showing that the normal supply has been restored.

2.6.4 Three-yearly

The monthly inspection should be carried out together with the following the following additional tests:

The entire emergency lighting installation should be tested and inspected to ascertain compliance with this British Standard.

Each luminaire and internally illuminated exit sign should be tested for its full duration.

At the end of the test period the supply to the normal lighting should be restored and any indicator lamp or device checked to ensure that it is showing that the normal supply has been restored.

On completion of the three-yearly inspection and test, ***a periodic inspection and test certificate,*** (model - paragraph 3.2), should be supplied to the owner of the premises.

2.6.5 Subsequent annual test

This should be carried out in accordance with the requirements for the three-yearly model. A ***periodic inspection and test certificate*** should be supplied to the owner of the premises. However, this solely concerns the full rated discharge test of the luminaires and not the other parts of the three-yearly test.

2.7 Requirements and steps to be taken by Local Authority

2.7.1 CommissioningTest

The Case Officer should witness the commissioning test and check that all the indicators, showing that the mains supply is healthy and the battery charging, are illuminated. The Officer should also require the person responsible for commissioning the system to simulate mains failure by switching off the lighting to the escape route(s) at the distribution board. All the luminaires should then be checked to ensure that they are illuminated.

The mains failure should not be simulated using the test switch in case the mains supply to the luminaires has been incorrectly wired.

The Case Officer should ask to see the Log Book.

Copies of the following certificates should then be required to be sent to the Case Officer for approval:

- The completion certificate to show that the emergency lighting for the premises has been designed, installed and tested in order that it complies with BS 5266 : Part 1 : 1988. (model - paragraph 3.1)

- A completion certificate to confirm that the Emergency Lighting system complies with the current edition of the IEE Regulations.

2.7.2 Three-Yearly and subsequent Annual Tests

Copies of the three- yearly and subsequent annual checks should be required to sent to the Local Authority.

3.0 Model certificates and monthly servicing schedule

The following model certificates and schedule are drafted in BS : 5266 : Part 1 : 1988.

- Completion certificate (3.1)
- Peridic inspection and test certificate (3.2)
- Model servicing schedule (3.3)

3.1 Model completion certificate

Emergency lighting - Completion certificate for new installation or alterations

Occupier/owner .....
Address of premises.....
.....Tel no.....
Designer's name.....
Designer's address.....
.....Tel no.....
Work carried out and covered by this certificate shown on drawing no's.....
.....(see 3.3 of BS 5266 : Part 1 : 1988)

I/We certify that the emergency lighting installation, or part thereof, at the above premises has been designed by me/us and to the best of my/our knowledge and belief, the system complies with the appropriate recommendations given in BS 5266 "Emergency lighting" Part 1: 1988 "Code of Practice for the emergency lighting of premises other than cinemas and certain other special premises used for entertainment", published by BSI for a category.....* installation , except as stated below. Photometric design data is appended to this certificate.

Signature of person responsible for design of the system.....
Qualification ..... Date .....
For and on behalf of .....
Installer's name .....
Installer's address .....
.....Tel No.....

Work carried out and covered by this certificate shown on drawing no's .....
.....(see 3.3 of BS 5839 : Part 1 : 1988)

I/We certify that the emergency lighting installation, or part thereof, at the above premises has been installed by me/us in accordance with the designer's specification and to the best of my/our knowledge and belief, the system complies with the appropriate recommendations given in BS 5266 "Emergency lighting" Part 1 : 1988 "Code of Practice for the emergency lighting of premises other than cinemas and certain other special premises used for entertainment", published by BSI for a category.....* installation , except as stated below.

Signature of person responsible for installation of the system.....
+ Qualification.....Date.....
For and on behalf of .....
System verifier's name.....
System verifier's address.....

I/We certify that the emergency lighting installation, or part thereof, at the above premises has been inspected and tested by me/us and to the best of my/our knowledge and belief, the system complies at the time of my/our test with the appropriate recommendations given in BS 5266 "Emergency lighting" Part 1: 1988 "Code of Practice for the emergency lighting of premises other than cinemas and certain other special premises used for entertainment", published by BSI for a category.....* installation , except as stated below. Photometric verification data is appended, including light loss factors on photometric design , or the test data obtained from measurements carried out in accordance with appendix A of BS 5266 : Part 1 : 1988.

Signature of person responsible for verification.....
Qualification.....Date.....
For and on behalf of.....

Details of variation from the Code of practice (BS 5266 : Part 1 : 1988)

3.2 Model periodic inspection and test certificate

Emergency lighting - Periodic inspection and test certificate

Occupier/owner.....

Address of premises.....

..... Tel no .....

Date of inspection and test.....

Inspection and test carried out by.....

Name and address.....

.....Tel no.....

I/We hereby certify that the emergency lighting installation at the above premises has been inspected and tested in accordance with the schedule below by me/us and to the best of my/our knowledge and belief complies at the time of my/our test with the recommendations of BS 5266 "Emergency Lighting" Part 1 : 1988 "Code of Practice for the emergency lighting of premises other than cinemas and certain other specified premises used for entertainment" published by BSI, for a category..... * installation, except as stated below.

Signature of person responsible for inspection and test .....

Qualification.....Date.....

For and on behalf of.....

Details of variation from the code of practice (BS 5266 : Part 1 : 1988)

Note 1 Because of the possibility of failure of the supply to the normal lighting occurring shortly after a period of testing, all tests should be undertaken at times of minimum risk. Alternatively, suitable temporary arrangements should be made until the batteries have been recharged.

Note 2 The figures in brackets indicate the relevant clauses of BS 5266 : Part 1 : 1988

.....continued

Model periodic inspection and test certificate (concluded)

a) Are correct entries made in the log book? YES/NO

b) Are record drawings available? YES/NO

c) Are record drawings correct? YES/NO

d) Signs
Are the signs positioned correctly? YES/NO
Are the details of the signs correct? YES/NO
Do the self-luminous signs (if any) need changing before the date of the next scheduled inspection? If so state date.....
(See label on sign)

e) *Luminaires.* Are luminaires correctly position? YES/NO

f) *Illuminations for safe movement*
Are the correct lamps installed in the luminaires? YES/NO
Has there been any change in the decor or lay-out of the premises since the last inspection, which has caused any significant reduction in the effectiveness of the lighting system? (Any changes to be stated under COMMENT below) YES/NO
Is the installation in a generally satisfactory condition? YES/NO

g) *Marking*
Are the category and nominal operating voltage of the system clearly marked or readily identifiable? YES/NO
Are luminaires clearly marked to indicate the correct lamp for use? YES/NO
Is information available to ensure correct battery function? YES/NO

h) Wiring systems
Are the results recorded on the last inspection and test certificate satisfactory? YES/NO
State the date of this inspection and test.....

i) *Power Services*
Are the charging arrangements for the batteries satisfactory? YES/NO
Do changeover devices operate satisfactorily upon simulation of failure of the normal supply? YES/NO

j) *Central Battery systems including back-up batteries*
Refer to model periodic inspection and test certificate in BS 5266 (these systems will rarely be encountered).....

k) *Engine driven generating plant*
Refer to model periodic inspection and test certificate in BS 5266 (these systems will rarely be encountered).....

l) *Self-contained luminaires and signs*
After operation for the rated duration, does each self contained luminaire and sign operate? YES/NO
Following restoration of the system to normal supply, is the battery charger functioning? YES/NO

COMMENT (if any) and variation from the Code of Practice

3.3 Model servicing schedule

Schedule of monthly servicing to be carried out by or on behalf of the occupier/ owner

In addition to the instructions given below, the instructions issued by the manufacturer should be observed.

- Check that defects recorded in the log book have been corrected
- Clean the exterior of the luminaires and signs
- Check correct operation of luminaires and internally illuminated signs by operating the test facility
- Check correct operation of engine driven generator(s) and carry out the manufacturer's recommended maintenance
- Check fuel tanks, oil and coolant levels and top up as necessary
- Check level of electrolyte in batteries of central battery systems and generator starter batteries
- Check that all indicator lamps are functioning correctly
- Record data in the log book

FIRE EXTINGUISHERS

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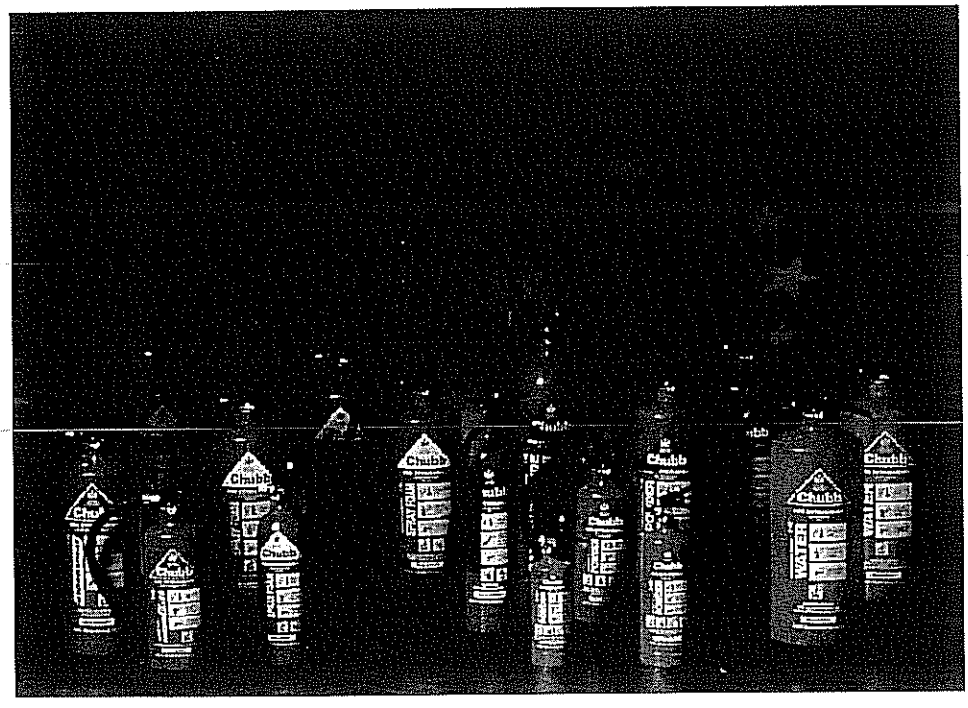

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FIRE EXTINGUISHERS

1.0 INTRODUCTION

There are a number of British Standards covering portable fire extinguishers. Some standards have recently introduced to reflect the harmonisation within the European Union. These Standards are set out below. For the purposes of relating this guide to the current ***HMO Code of Practice,*** the previous British Standard, where appropriate, is also given

Current British Standard	Previous British Standard	Title
BS EN 2 : 1992	BS 4547	Classification of Fires
BS EN 3 Parts 1-6 : 1996	BS 5423 : 1987	The manufacturing standard for portable fire extinguishers (except fire blankets)
BS 7863 : 1996	N/A	Colour coding to indicate the extinguishing media contained in portable fire extinguishers
BS 6575 : 1985	N/A	Fire blankets
BS 5306 : Part 3 : 1985	N/A	Fire extinguishing installations and equipment on premises. Part 3 : Code of Practice for selection, installation and maintenance of portable fire extinguishers

Table 11.1 - To illustrate present and previous British Standards concerning fire extinguishers

2.0 THE CLASSIFICATION OF FIRES

The classification of fires is laid down in BS EN 2 : 1996

In HMOs the class of fire will generally be :

Class A - involving solid materials and producing glowing embers
Class B - involving liquids (e.g. chip pan fires in kitchens) and also those involving an electrical element, live electricity

The type of fire extinguisher within an HMO will then take this into consideration.

In common parts - class A
In shared kitchens - class B

3.0 THE MANUFACTURING STANDARD FOR PORTABLE FIRE EXTINGUISHERS

3.1 Rating/Classification of Fire Extinguishers

The classification and rating of portable fire extinguishers is laid down in BS EN 3 Part 1 : 1996. It sets out the methods of testing the performance rating of extinguishers used on different types of fires.

The distribution of extinguishers throughout the premises should be based on the extinguisher's performance rating and not, as previously, on the capacity of the extinguisher.

The rating should be 13A (in common parts) and 34B (in shared kitchens).

13A types will commonly be :

- 9 litre water types.
- *Chubb 6 litre Hydrospray*

It should be noted that, extinguishers containing a different extinguishing medium e.g. foam or dry powder can also achieve a 13A rating. However the current ***HMO Code of Practice*** clearly states that "water type" fire extinguishers shall be used and this practice must be followed.

34B types will commonly be :

- 2 Kg Carbon Dioxide type

These extinguishers are intended primarily for use on electrical fires

It is recommended that fire blankets are provided for shared kitchens to cater for chip pan or frying pan fires. (These are not covered by BS EN 3 : 1996)

3.2 Colour Coding Of Fire Extinguishers

Fire extinguishers have traditionally been of uniform colour depending on the type of media they contain e.g. red for water, black for carbon dioxide, cream for foam and blue for powder.

Since January 1997, the body colour of all new fire extinguishers, manufactured in accordance with BS EN 3 : 1996, is **red**, irrespective of the contained extinguishing media.

BS EN 3 : 1996 does permit a coloured panel of not more than 5% of the surface area of the extinguisher body shell to indicate the extinguishing agent. To this end BS 7863 : 1996 has been published. This requires that the coloured panel (Table 11.2) is sited immediately above or in Section 1 of the operating instruction label.

Extinguishing Agent	Colour of panel (5%) to indicate extinguishing agent
Water	Red
Foam	Pale Cream
Powder (all types)	Blue
Carbon Dioxide	Black

Table 11.2 - To illustrate colour of panel applied to fire extinguishers

All portable fire extinguishers which bear the BSI kitemark showing they comply with BS EN 3 : 1996 will also comply with BS 7863 : 1996.

It should be noted that although most manufacturers and suppliers will only sell fire extinguishers that comply with BS EN 3 : 1996 it is not a legal requirement and therefore it will be possible to obtain traditional coloured fire extinguishers after January 1997.

However, it is recommended that all Section 352 notices should specifically state that extinguishers must comply with BS EN 3 : 1996 and BS 7863 : 1996. (The LFCDA policy directive states that all new fire extinguishers must comply with BS EN 3 : 1996.)

Old fire extinguishers will gradually be replaced as part of the maintenance programme. In the interim it is permissible for both the old and new colour schemes to be sited on the same premises. It is, nevertheless, good practice that once one of the extinguishers is replaced they should all be replaced in order that they are all of the same colour and appearance.

It is not permitted to paint existing extinguishers red.

4.0 SUMMARY OF FIRE EXTINGUISHER REQUIREMENTS IN HMO's

The current ***HMO Code of Practice*** recommends the following:-

Water type fire extinguishers required in escape routes
Carbon Dioxide type required in shared kitchens
Fire Blankets (in red holder) required in shared kitchens

Water type extinguishers required on each floor.

- Floor area up to 100 sq. m. requirement is 1 X 13A water type

- Floor area 100 to 200 sq. m. requirement is 2 X 13A water type
- Floor area greater than 200 sq. m. requirement is 2 X 13A water type plus 1 X 13A for each additional 200 sq. m.

Carbon Dioxide type extinguishers required in shared kitchens

- 1 X 34B , Carbon Dioxide type extinguisher (2Kg capacity) per kitchen

Fire blanket, to comply with BS 6575 : 1985, required in shared kitchens

- One per kitchen

5.0 LOCATION

Fire extinguishers should be located in conspicuous positions where readily seen by persons following the escape route e.g. outside rooms, outside lobbies, on landings etc.,

- Hung on brackets with handle approx. 1.5 metres from floor
- Away from heaters
- Away from areas where may be subject to damage
- Not obstructing escape routes
- Not obscured by cupboards, opening doors, etc.
- Not in recesses out of direct sight
- Fire blankets to be in wall mounted holders near the cooker but not above it

6.0 MAINTENANCE AND SERVICING

This is laid down in BS 5306 : Part 3 : 1985, Section 3, Clause 7

A monthly routine inspection by user should:-

- Ensure the extinguisher is in the correct position
- Check they have not been discharged, lost pressure or suffered obvious damage
- Replace any which are subject to the above

An annual inspection must be carried out by a ***Competent Person.***

The date of the annual inspection is to be marked on each extinguisher.

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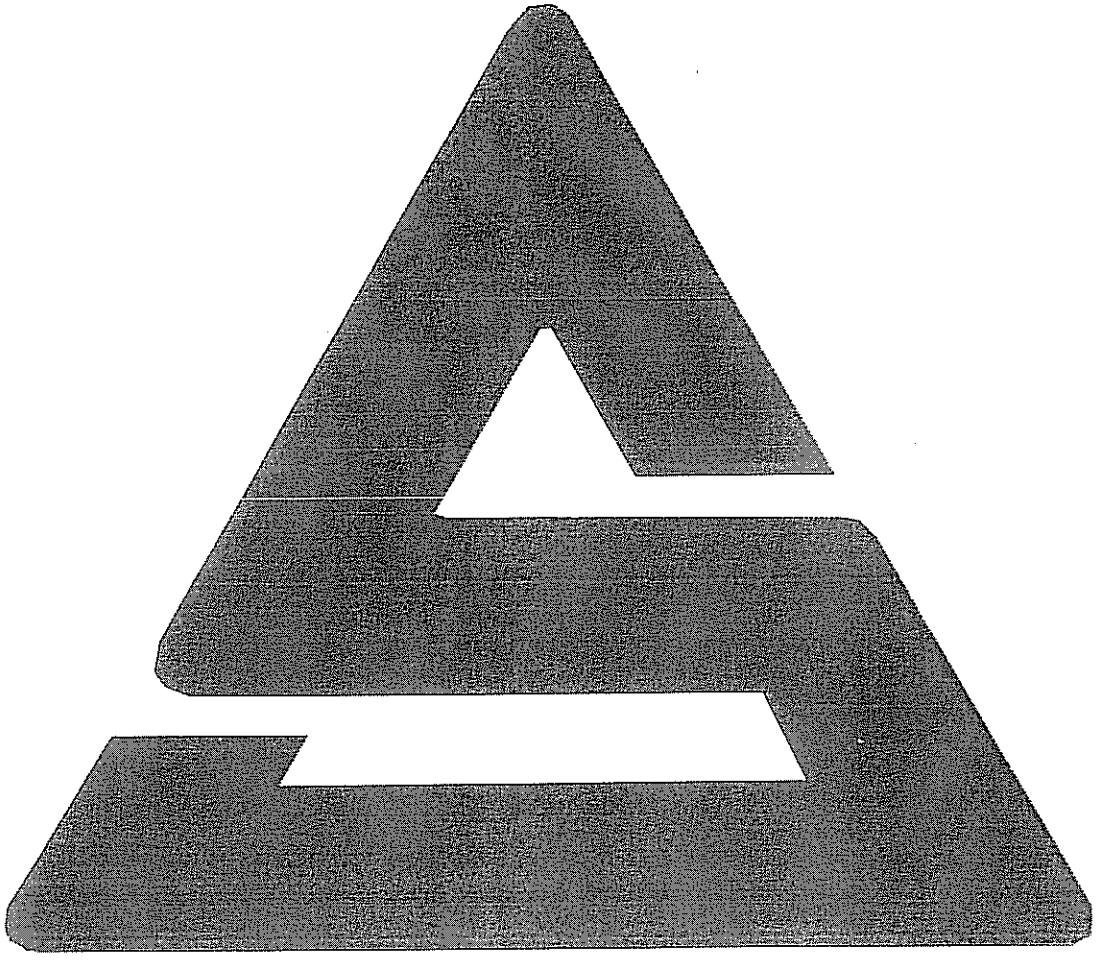

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SIGNS AND NOTICES

1.0 INTRODUCTION

1.1 The Health and Safety (Safety Signs and Signals) Regulations 1996 implement an EU Directive and came into force on April 1st 1996. These new Regulations have been designed to standardise safety signage across the EU and replace the Safety Signs Regulations 1980. The new Regulations do not technically apply to most HMOs as they are secondary legislation under the Health and Safety at Work Act 1974. However these Regulations now set the industry standard for safety signs and should be implemented as a matter of good practice although they cannot be required.

1.2 The British Standard for safety signs generally is BS5378. **BS 5499 : Part 1 : 1990** extends it to apply to fire safety signs specifically. Signs detailed in these Standards will also comply with the new Regulations.

1.3 Signs with worded text only are no longer acceptable. Signs **must** contain a pictogram.

1.4 In the case of emergency exit signs the design under the above British Standard is similar to that in the new Regulations (paragraph 3.2). Either design will comply.

1.5 The main difference between the two is that the BS design includes worded text as well as a pictogram. It is recommended that the BS (words & pictogram) version is used to allow familiarity with the pictograms to develop.

1.6 All fire safety signs must comply with either the British Standard or the Regulations from 24th December 1998. Until then existing fire safety signs, with or without a pictogram, do not legally require replacing but it is strongly recommended that they are replaced to the standard above as part of all section 352 notices.

2.0 FIRE SAFETY SIGN TYPES

There are six classes of fire safety sign. The shape, design and colour of sign are laid down in BS 5378 and BS 5499

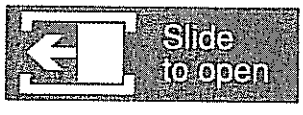
The six classes are:-

- Prohibition sign
  ("Do not do...")
  - red circular band and crossbar,
  - white background, black symbol
  - text on a supplementary sign.

- Warning sign
  ("Danger")
  - black equilateral triangle,
  - yellow background,
  - symbol or text in black.

- Mandatory sign
  ("Must do....")
  - circle, blue background
  - symbol or text in white.

- Safe Condition Sign
  ("The safe way")
  - square or oblong, green background,
  - symbol or text in white.



- Fire Equipment Sign
  ("Location of.....")
  - square/oblong, red background,
  - symbol or text in white.

- Supplementary Sign
  ("Extra information")
  - white square/oblong with text in black
    OR
  - square/oblong of same colour as accompanying sign- text in relevant contrasting colour

3.0 SIGNS TO BE USED IN HMOS

3.1 Fire doors

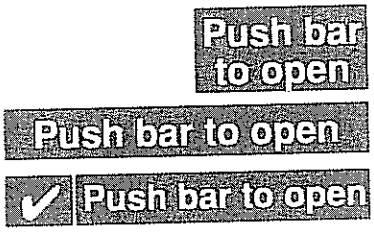
Some mandatory signs shown in BS 5499 (e.g. "Fire Door Keep Shut") do not incorporate a pictogram. However, signs with pictograms are available and may be used. Any of the signs shown below comply :

Fire Door - Keep Shut
Blue background, White lettering
Diameter 50mm, Lettering minimum 5mm.
Fix on both faces of all fire doors except to individual bedsits/flats/boiler rooms/stores
Fix at eye level

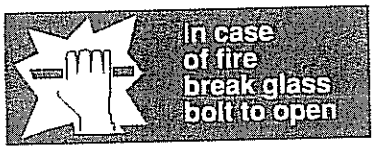
Fire Door - Keep Locked
Blue background, White lettering
Diameter 50mm, Lettering minimum 5mm.
Fix on outside face of doors to cupboards/ stores in the protected route.
Fix at eye level.

Automatic Fire Door Keep Clear - Close at Night
Blue background - White Lettering
Diameter 80mm, Lettering minimum 5mm.
Fix on both faces of doors which are held open by automatic door closers linked to the fire alarm.
Fix at eye level.

Fire Escape - Keep Clear
Blue background, White lettering
Diameter 240mm, Lettering 20mm
Fix on both faces of any door used solely for means of escape and because of infrequent use are liable to be obstructed.
Fix at eye level

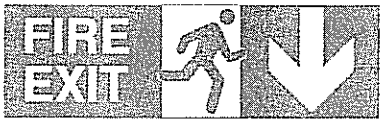


Push Bar To Open
Green Background, White lettering
Lettering 15mm height
Fix on any door fitted with a push bar opener immediately above the push bar

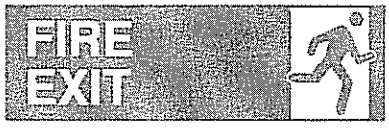


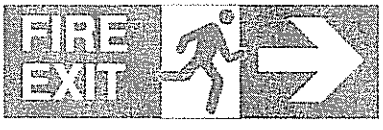
In case of fire break glass bolt to open
Green background, White lettering 5mm
Fix on any door fitted with break glass/ ceramic bolt.
Fix immediately above the bolt.

3.2 Exit and Directional Signs



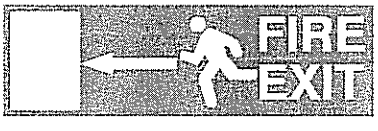
Fire Exit and Running Figure
Green Background, White lettering
Lettering height 15mm (or 20mm if sign to be viewed from more than 7.5m away).
To mark any exit which is a means of escape but is not the usual route of travel (e.g. secondary means of escape, door through party wall etc.)
Fix directly above the door or adjacent to it so as to confront persons making exit. If not above the door, must incorporate a directional arrow.





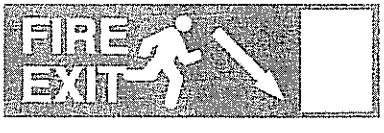
Also to be fixed along the escape route at any point where the exit cannot be seen or where any confusion may arise (e.g. where more than one direction possible or where unusual turnings encountered).

Must have running person symbol and directional arrow. Directional arrows not to be used in isolation.

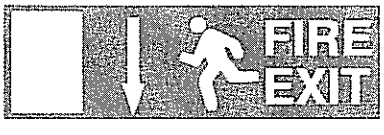


Available with figure running either right or left - ensure correct direction is used.

Fire Exit wording not essential but recommended.



These signs to be adequately illuminated by the normal artificial lighting and the emergency lighting or to be internally illuminated.



It is recommended that when installing these signs the same design theme is used throughout the premises i.e. those to the British Standard or the Regulations.

4.0 SIZE OF SIGNS

The sizes specified above are recommended in BS 5499 : Part 1 : 1990 either specifically or dependant upon the distance of viewing.

SURFACE FINISHES & FURNISHINGS

SURFACE FINISHES AND FURNISHINGS

1.0 WALLS, PARTITIONS, CEILINGS AND SOFFITS

In the early stages of a fire the safety of a building's occupants can be affected by the properties of surface linings and finishes to walls, partitions, ceilings and soffits. Rapid spread of flame across surfaces allows the fire to spread more rapidly through the building thereby reducing the time for escape. This is of particular concern in escape routes, especially in single staircase buildings.

1.1 Classification of materials and products for surface spread of flame

Two British Standard tests exist ;

- BS 476 : Part 7 : 1971/1987 "Method of classification of the surface spread of flame of products".

This details a test for determining the rate of spread of flame across the exposed surface of a material/product. It classifies performance from Class 1 to Class 4 (Class 1 being the highest performance/slowest spread of flame and Class 4 the lowest performance/most rapid spread of flame)

- BS 476 : Part 6 "Method of test for fire propagation of products".

This details a test for determining the ease of ignition, rate of heat release in fire and other properties of materials and products. It gives a Class 0 rating for those materials/products which are found to be of limited combustibility or to have a low fire propagation index.

When assessing materials/products for their suitability in a particular HMO location it is necessary to ensure the material/product's classification meets or exceeds the minimum required (Refer to Table 14.1). Class 0 will satisfy Class 0, 1, 2, 3 and 4 locations. Class 1 will satisfy Class 1, 2, 3 and 4 locations but not Class 0 locations, etc. This can only be done by reliance upon a valid test report from a ***UKAS (ex. NAMAS) registered testing house.*** The report will detail the product and give it a classification from 0 to 4. (Class 0 will quote Part 6 of the above British Standard and Classes 1-4 will quote Part 7). For proprietary products it is essential to ensure that the product installed on site does not differ in any way from that in the test report specification. Minor differences in thickness, substrate, colour, fixings, adhesive etc., may affect the rating and performance.

1.2 Standard required in HMOs

With the exception of small areas of wall surfaces (Refer to Table 14.2 Group), the surface finishes of walls, partitions, ceilings and soffits should meet the minimum standard in Table 14.1.

Type of HMO	Locations	Minimum Class (BS 476 : Part 7 : 1971)
All HMOs including Hostels	Stairways,Hallways Landings, Lobbies (ie. all circulation spaces)	Class 1
Hostels only	Rooms 4 sq.m. floor area or more	Class 1
	Rooms less than 4 sq.m. floor area	Class 3

Table 14.1 - To illustrate minimum classification for rate of spread of flame permitted in different locations

Note : space dividers or other similar vertical surfaces which sub-divide rooms or common areas should also meet the above standard.

1.3 Acceptable locations for commonly encountered materials/ products

It is clearly impossible to identify the classification of existing coverings on-site in HMOs unless the trade name of the product can be traced. Table 14.2 illustrates acceptable locations for materials and products commonly encountered. Where the trade name of the product under consideration is known or can be traced, the classification should be sought from the manufacturer. For new products/ materials to be installed, the manufacturers should be required to confirm the classification of their product and produce a valid test report if appropriate. Table 14.2 gives a general guide in all other cases.

1.4 Multiple layers of gloss paint

Surfaces may be found where multiple layers of gloss paint have been applied. These surfaces will not provide Class 1 under BS 476 : Part 7 : 1971/1987. Therefore it is recommended that the paint is removed from locations requiring a Class 1 classification. Proprietary products may be available which can cover the paint thereby providing a Class 1 surface. These should only be used subject to a satisfactory fire test report but are not recommended for areas subject to heavy wear and tear.

Material/Product	Acceptable locations
A Brickwork, blockwork, concrete, plasterboard (all types), plaster finishes (including render on wood or metal laths, and Any other product with Class 0 classification and valid test report.	All locations including hostels
B Timber, hardboard, particleboard (chipboard) and Any other product with Class 3 rating with valid test report.	**ALL TYPES OF HMO (incl. hostels)** Not permitted in escape routes ie. stairways, hallways, landings, lobbies **HOSTELS ONLY** Permitted in: small rooms not greater than 4 sq. m. floor area, Small areas of walls in larger rooms (area not greater than half floor area or 20 sq. m. whichever is lesser Not permitted on ceilings **HMOs (not hostels)** Unrestricted in rooms
C As Group B above but flame retardant treated to Class 1 with valid test certificate	All locations including hostels
D Woodwool slab	All locations including hostels
E Non flame retardant decorative laminates	As Group B above
F Flame retardant decorative laminates to Class 1 with valid test certificate	All locations including hostels
G Expanded polystyrene wall and ceiling laminates - ♦ max. thickness 5mm (walls), 12mm (ceilings), with only one coat of water based emulsion finish	As Group B above
♦ where painted with gloss paint	Not permitted in any location, should be removed if existing
H Thin vinyl and paper coverings on inorganic (Group A above) surface	All locations including hostels
I Heavy flock paper - non-flame retardant grade	As Group B above
J Heavy flock paper - flame retardant grade to Class 1 with valid test certificate	All locations including hostels

Table 14.2 - Classifications of rate of spread of flame for various products and acceptable locations for their use

Footnote to Table 14.2: Class 1 can sometimes be achieved by the application of proprietary products. It is imperative to obtain a valid test report for the product in an identical test scenario. Any deviation from the test specification may lower the performance of the product in situ. Durability and maintenance is another consideration. If the building is heavily used and subject to damage or vandalism it may be inappropriate to accept such products.

2.0 FLOOR COVERINGS

The current ***HMO Code of Practice*** states that floor coverings throughout the protected route (ie. stairways, hallways, landings and lobbies) of all categories of HMO including hostels should conform to low radius of fire spread (up to 35mm) when tested in accordance with BS 4790.

BS 4790 "Method for determination of the effects of a small source of ignition on textile floor coverings (hot metal nut method)" : specifies a standard, controlled test to which floor coverings are submitted. Floor coverings, having been tested, are classified according to the extent and rapidity they allow fire to spread across them. The classification required in this context is low radius of fire spread (up to 35mm).

BS 5287 "Specification for assessment and labelling of textile floor coverings tested to BS 4790" specifies how these tested floor coverings are to be labelled.

It is of course difficult to assess existing floor coverings in HMOs unless the supplier/manufacturer can be traced. As a general guide for existing carpets, those comprising a mix of 80% wool, 20% synthetic fibre (commonly referred to as 80/20 carpets) will comply.

When considering the suitability of new floor coverings for protected routes it is sufficient to ensure the carpet is labelled to BS 5287 above as low radius of fire spread (up to 35mm). Suppliers/manufacturers will be able to confirm.

3.0 FURNITURE AND FURNISHINGS

The Furniture and Furnishings (Fire) (Safety) Regulations 1988 (as amended in 1989 and 1993) set levels of fire resistance for domestic upholstered furniture, furnishings and other products containing upholstery.

It covers most items of furniture found in HMOs including beds, mattresses, pillows, cushions etc. It does not include carpets, curtains or duvets.

The regulations apply to all persons who supply furniture and furnishings, in connection with accommodation, in the course of a business. In general, this includes landlords, letting agents and managing agents. For advice on whether the regulations apply in a particular situation contact the Trading Standards dept.

3.1 The effect of the regulations

From 1st January 1997, all furniture within lettings commencing after that date **must** meet the fire resistant requirements of the regulations.

NOTE: The regulations do not apply to furniture made before 1950 and re-upholstered furniture made before that date.

Since 1988, all new furniture (except mattresses and bed bases) have had to carry a permanent label which is securely attached to an external surface (except seating furniture where it may be found on the platform underneath any removable cushion). (Refer to paragraph 3.5 for examples of the permanent labels).

However, it is important to note that simply because furniture does not have a permanent label it does not mean that it does not comply with the regulations. This is because :

- Furniture constructed before 1988 may comply with the regulations. Further, it is not possible to determine whether it does comply without carrying out a "burn test". This even applies to foam filled furniture
- The label may have been torn off.

3.2 Advice and enforcement

The regulations are enforced by Trading Standards. Enforcement action is subject to statutory time limits.

Legal action will only be possible within 6 months of the date of supply of the furniture i.e.

- 6 months from the date that a new tenant moves into the accommodation
- 6 months from the date that additional or replacement furniture is supplied to existing tenants.

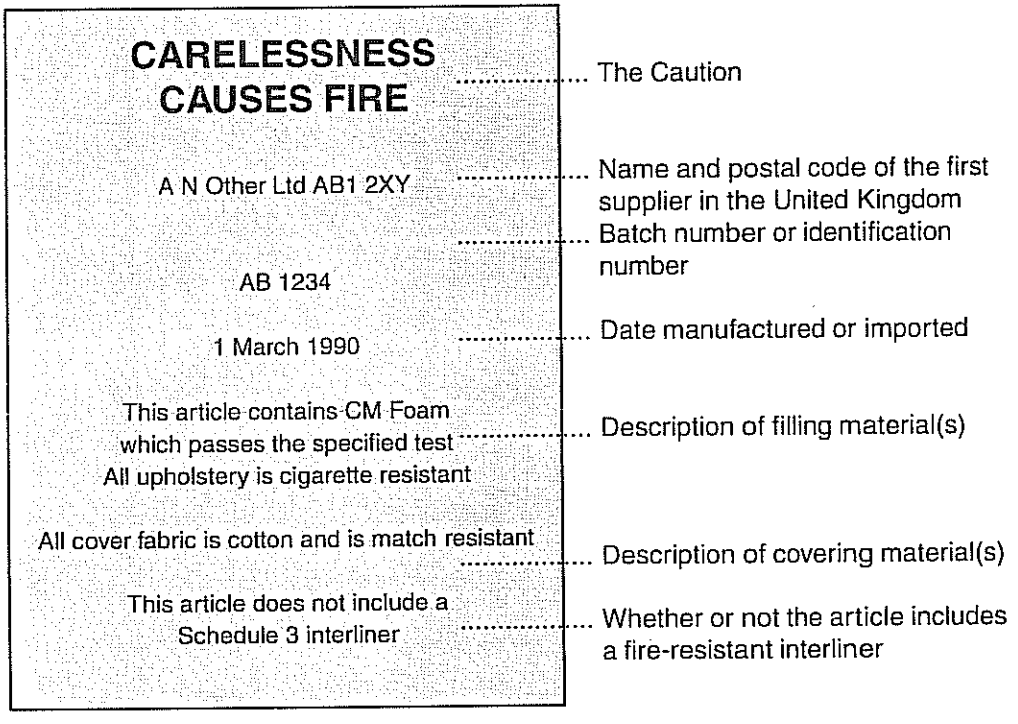
Given the above information it would appear that inspection of furniture is not going to become a regular item on the EHO enforcement routine although, of course, landlords should be made aware of the regulations wherever possible and advised to obtain furniture carrying permanent lables to provide themselves with a "Due Dilligence" defence. Further it would help to reduce any civil liability in the event of a fire involving furniture.

3.3 Further guidance

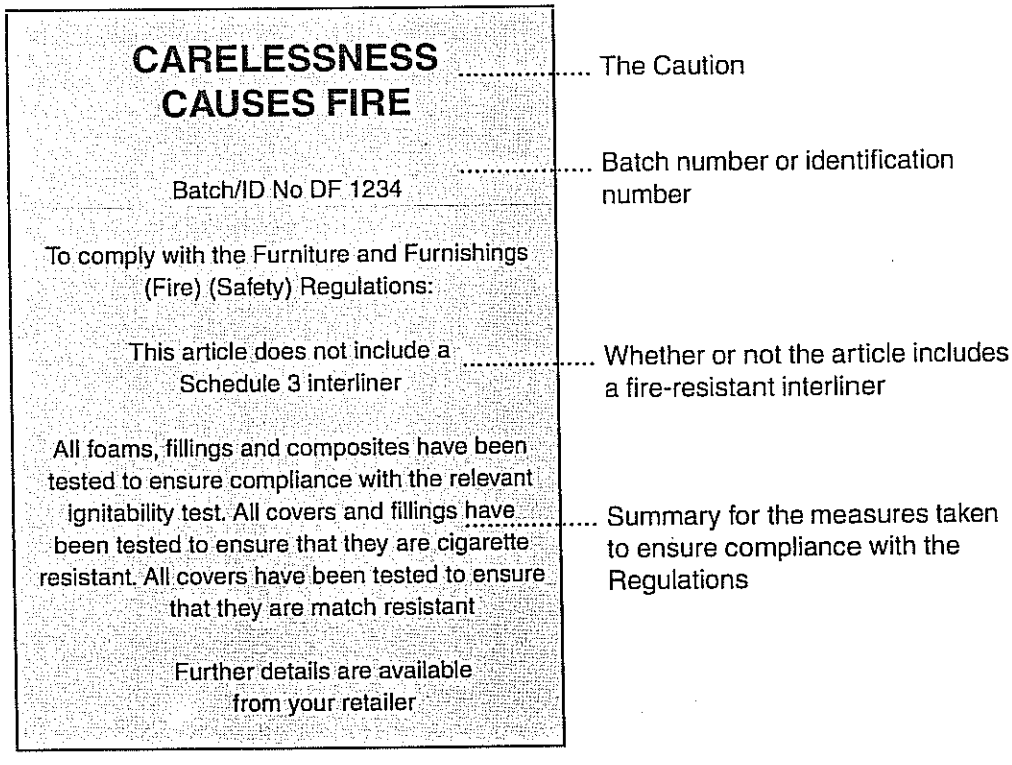
This can be obtained from The Guide to the Furniture and Furnishings (Fire) (Safety) Regulations published by the Department of Trade and Industry or from Trading Standards departments.

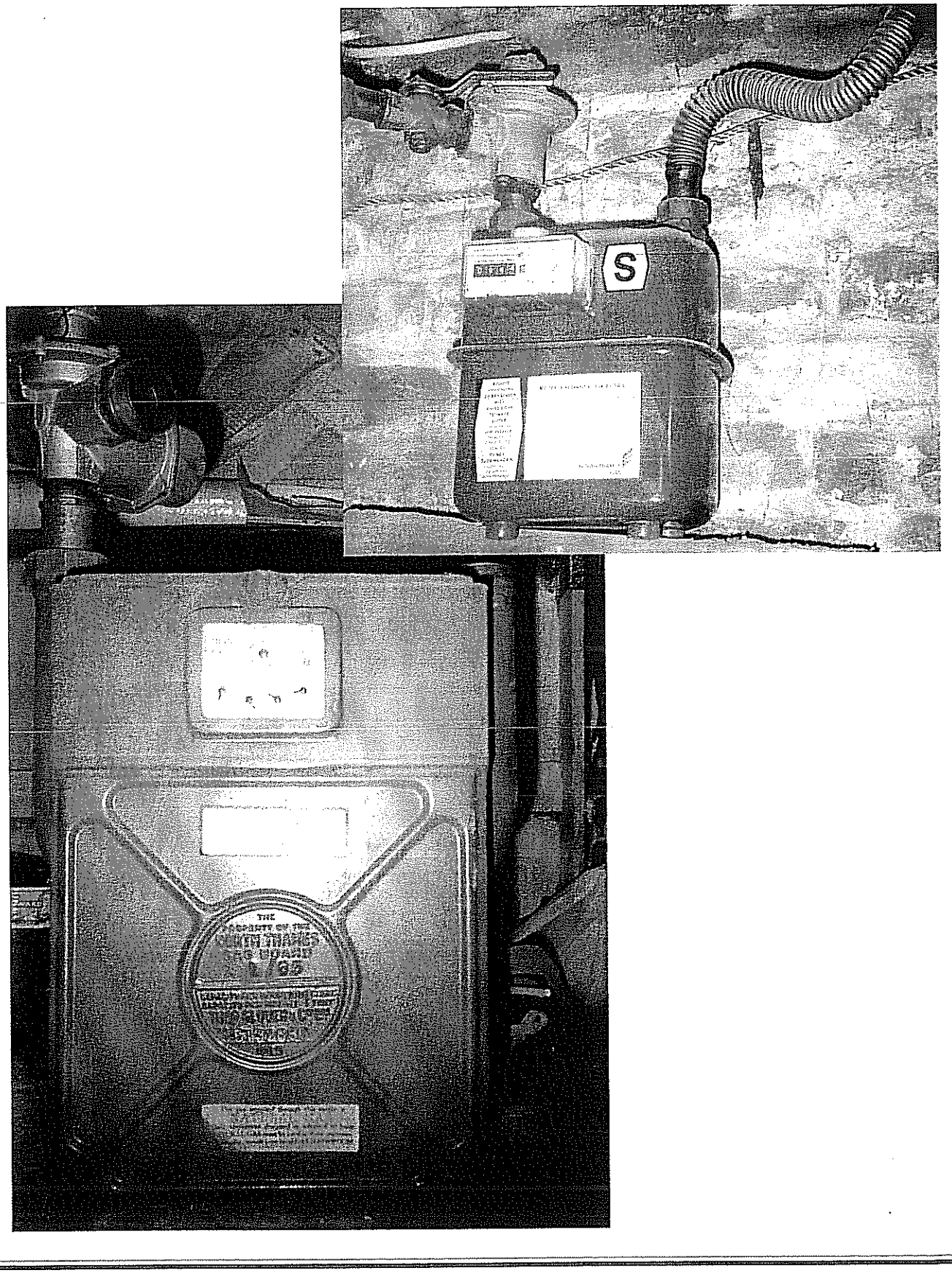
3.4 Examples of permanent labels for an item of domestic upholstered furniture

3.4.1 Example of label giving full information :



3.4.2 Example of shorter label :

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GAS SERVICES

1.0 INTRODUCTION

The current ***HMO Code of Practice*** states that "Gas meters, other than those installed in accordance with the appropriate Gas Safety Regulations, are prohibited within the staircase enclosure. Gas pipes must be made of a material with a high melting point in order to comply with Gas Safety Regulations".

2.0 THREE STOREY PROPERTIES AND ABOVE

The Gas Safety (Installation & Use) Regulations 1972 prohibited the installation of meters, where one did not already exist on or under a staircase or any other part of the building that provided the only means of escape in case of fire, in dwellings of three or more storeys.

However if there is an existing meter one of the following four options must be followed :

- Meter to be exchanged for a meter that is fire-resistant i.e. steel cased
- Meter to be housed in a 30 minute fire resistant compartment (no ventilation required) which has doors fitted with automatic self-closing devices
- The pipe upstream of the meter to be fitted with a thermal cut-off valve designed to operate at 95°C ambient temperature
- Meter to be re-sited away from the risk area.

NOTE : It is recommended that the second option (housing meters in fire resistant compartments with self-closing doors) should be avoided as in practice it is difficult to achieve, particularly the provision of the self-closing fire resistant doors.

These provisions relate to all meters irrespective of whether it is the primary meter or secondary meter and relate to all persons. Thus any person installing or exchanging a meter since 1972 whether for British Gas (or anyone else) must ensure that the relevant regulations have been conformed to.

3.0 TWO STOREY PROPERTIES

A new meter can be fitted under a staircase or any other part of the building, where the staircase or that other part of the building provides the only means of escape in case of fire, provided it conforms with the requirements set out in paragraph 2.0. All replacement meters must also comply with these requirements.

4.0 ALL PROPERTIES

Regulation 5 of The Gas Safety (Installation & Use) Regulations 1994 states that the use of lead or lead alloy or a non metallic substance is not permitted and should be replaced if found within the escape route.

The cost of replacing a meter, the inlet pipework and a maximum of 600mm of outlet pipework is met by the meter owner (generally British Gas, Transco) on **primary meter** installations. British Gas, Transco are presently completing a programme to replace the majority of the older tin case type meters. Therefore, any primary meter installation which does not comply with the above standards should be reported to British Gas, Transco who will carry out the necessary exchange works.

In general, new type meters tend to have round edges with a band around the middle. The "clock" type meters are generally old meters and are being replaced. (Refer to the divider card which illustrates the difference betwen the two types of meter - new type meter shown in top illustration).

Where alterations are required to the landlord's installation pipework or meter (**secondary meter**) then it is the landlord who is responsible for paying for this work. Any such work must therefore be included in the notice specification.

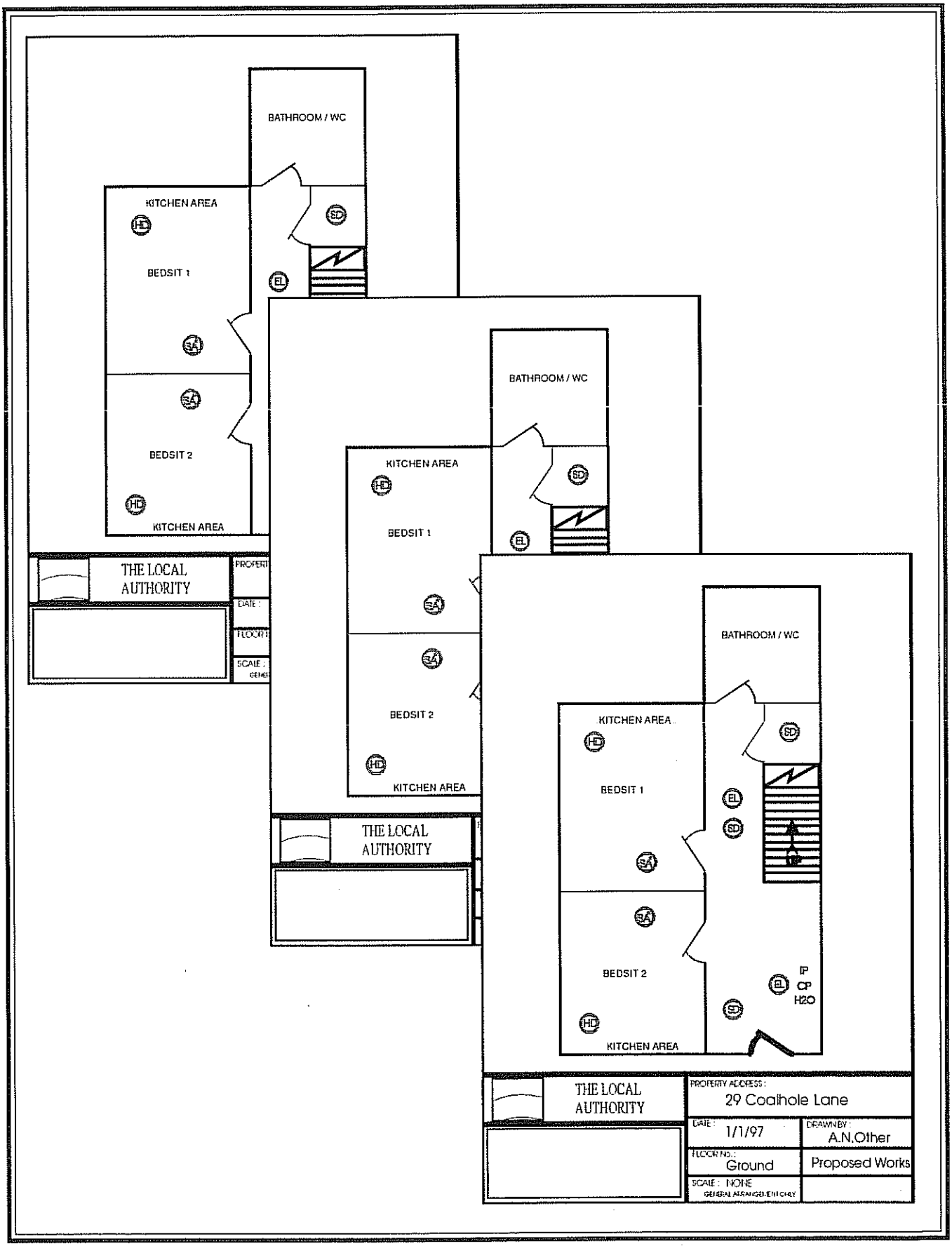
All work to gas installations must be carried out by CORGI registered contractors and must comply with the Gas Safety (Installation and Use) Regulations 1994 (as amended).

British Gas have advised that there is no objection to having a room sealed (e.g. balanced flue) gas appliance situated in the staircase enclosure.

Where a room sealed gas water heater is situated in a bathroom no fire protection measures are required to the room.

Any person providing gas through a secondary meter must ensure that a permanent notice is prominently displayed on or near the primary meter indicating the number and location of the secondary meters installed. Where there are more than two secondary meters the notice should illustrate their position in the form of a plan. Refer to The Gas Safety (Installation and Use) Regulations 1994, Regulations 15 - 17.

The user(s) of the secondary meter(s) should also be advised of the location of the primary meter by means of a notice on or near the secondary meter. There is no prescribed wording for these notices.


BATHROOM / WC
KITCHEN AREA
BEDSIT 1
BEDSIT 2
KITCHEN AREA
THE LOCAL AUTHORITY
BATHROOM / WC
KITCHEN AREA
BEDSIT 1
BEDSIT 2
KITCHEN AREA
THE LOCAL AUTHORITY
BATHROOM / WC
KITCHEN AREA
BEDSIT 1
BEDSIT 2
KITCHEN AREA
IP
CP
H2O
THE LOCAL AUTHORITY
PROPERTY ADDRESS :
29 Coalhole Lane
DATE :
1/1/97
DRAWN BY :
A.N.Other
FLOOR NO. :
Ground
Proposed Works
SCALE : NONE

FIRE DRAWINGS

1.0 INTRODUCTION

When serving Section 352 notices it is important to produce floor plans that can be readily understood by the fire officer and the recipient of the notice.

The LFCDA use plans to specify the precise works required and do not rely on a specification of works as set out in Section 352 notices. Their plans are thus very detailed and they use symbols that reflect the contents of BS 1635 : 1990.

Section 352 drawings are generally hand drawn and are accompanied by a specification and therefore only certain key symbols are required.

The drawings do not need to be to scale but they should be proportional sketches so as to reflect the layout and room sizes.

A key to the symbols and line type should be attached to all fire drawings that form part of Section 352 notices.

2.0 KEY TO LINE DRAWINGS AND SYMBOLS TO BE USED ON FIRE DRAWINGS

All doors, walls/partitions, screens and glazing which are required to be fire resisting under the current ***HMO Code of Practice*** and already comply are to be shown on the drawings as **thick black** lines.

All doors, walls/partitions, screens and glazing which are **NOT** required to be fire resisting under the current ***HMO Code of Practice*** are to be shown on the drawings as **thin black** lines.

All doors, walls/partitions, screens and glazing which are required to be fire resisting under the current ***HMO Code of Practice*** and do not currently comply are to be shown on the drawings as **red** lines.

(SD) = Smoke detector (required in BS 5839 Part 1 and Part 6 Grade A systems)

(SA) = Interlinked smoke alarm (required in BS 5839 Part 6 Grade D & E systems)

(SA*) = Non-Interlinked smoke alarm (for use in sleeping rooms that contain a kitchen facility)

(HD) = Heat detector (required in BS 5839 Part 1 and Part 6 Grade A systems)

(HA) = Interlinked heat alarm (required in BS 5839 Part 6 Grade D & E systems)

(EL) = Emergency lighting luminaire

A circle round a symbol indicates the area to be covered by the detector/ fitting and not the precise position which will be dictated by the appropriate British Standard

IP = Indicator Panel

CP = Call Point

CO2 = 2 Kg capacity carbon dioxide fire extinguisher

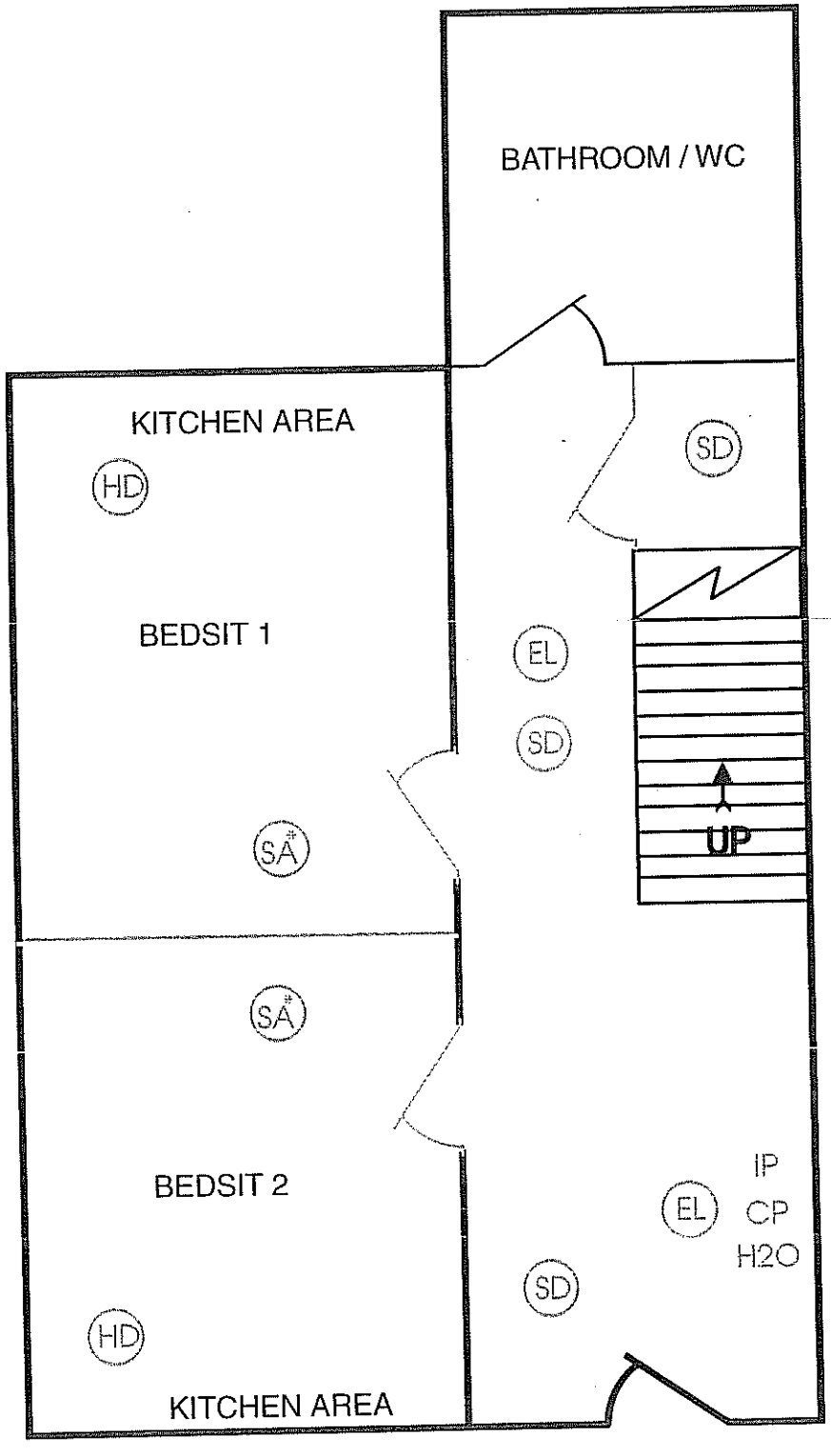
H20 = Type 13A rating water type fire extinguisher

FB = Fire Blanket

Symbols shown in **black** are those fittings/items already in existence.
Symbols shown in **red** are those fittings/items to be provided

3.0 FIRE DRAWING

An example of a fire drawing is illustrated in Figure 15.1.



THE LOCAL AUTHORITY

PROPERTY ADDRESS :
29 Coalhole Lane

DATE : 1/1/97

DRAWN BY : A.N.Other

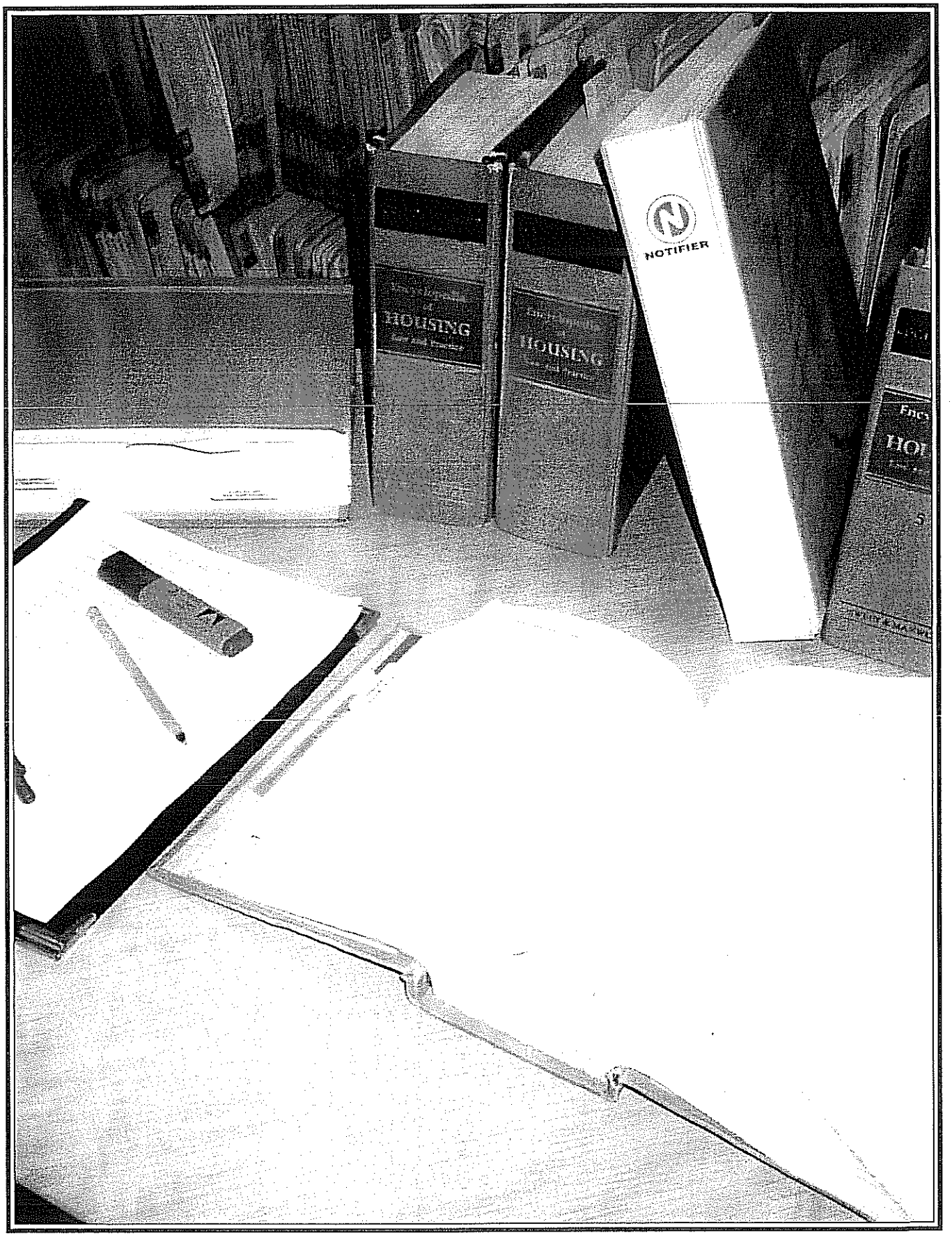
FLOOR No. : Ground

Proposed Works

SCALE : NONE
GENERAL ARRANGEMENT ONLY.

Figure 15.1 - Model Fire Drawing

INDEX, GLOSSARY & BIBLIOGRAPHY



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GLOSSARY

Areas of high fire risk	Room or other area which because of its function and/or contents, presents a greater risk of fire occurring and developing than elsewhere; e.g. large kitchens, boiler rooms, large storerooms and similar.
Assessment	See Fire Assessment
Assessment report	The report produced by a suitably qualified person (Competent assessor) following an assessment of a product or construction.
Back-up supply	See Stand-by Supply
BASEC	British Approvals Service for Cables - See Section 8, Page. 13, Paragraph 11.2
Centres	The distance between the centre points of two parallel timber members (e.g. in stud partition construction)
Circulation Spaces	Passages, corridors, landings, hallways, lobbies and stairways forming part of an escape route.
Competent Assessor	A person considered suitably qualified, experienced and competent to carry out a fire assessment. Difficult to identify as no formal qualification. Base identification on relevant experience with the product being assessed, track record, reputation, membership of a professional association, employment history and relevant qualifications. Will include UKAS registered testing houses, reputable fire consultants and the manufacturing company of the product to be assessed.
Competent Person	A person trained and experienced so as to be able to properly examine, test and undertake any remedial action and to present the information in a report.
Completion certificate	An electrical certificate that should be required where any major works (Minor works covered by a minor works certificate) are carried out to the wiring installation certainly where any new wiring is installed affecting the distribution board
Field of application report	A considered professional opinion on variations in construction, size, configuration etc. which will be acceptable on site and will not be detrimental to the fire performance of a product or construction. Issued by a suitably qualified person (Competent assessor). Must always link back to primary test evidence or assessment reports.

Final Exit	The termination of an escape route from a building giving direct access to a place of safety such as a street, passageway, walkway or open space and sited to ensure that persons can disperse safely from the vicinity of the effects of fire.
FIRAS	Fire Accreditation Scheme. The scheme covers the installation of passive fire protection products. FIRAS produce a register of all companies that are accredited as competent installers of fire resisting glazing
Fire Assessment	A considered professional opinion from a suitably qualified person (Competent Assessor) detailing the perceived likely performance of a product or construction in a fire situation where the product/construction in the assessed condition has not been tested full scale. Issued when a similar product or construction has been tested full scale but the product/ construction to be used varies slightly from the one tested. Assessment reports must always link back to primary test evidence from a UKAS registered testing house. Assessments are required because fire tests cover one particular construction of particular dimensions and configuration which may vary slightly on-site and it is impracticable to test every possible size and configuration.
Fire resisting door assemblies	Complete construction of door, frame, all door hardware (and intumescent products and smoke seals where appropriate) which has been tested by a UKAS registered testing house to prove it's fire resistance performance to a particular standard.
Fire test report	The documentation received from a UKAS registered testing house detailing a test carried out under BS 476 on a particular product or construction and the fire resistance performance achieved by the product/construction in that test.
Flat in Multiple Occupation (FMO)	A self-contained flat occupied by persons who do not form a single household
HMO Code of Practice	Department of the Environment, Circular 12/92 "Houses in multiple Occupation, Guidance to local housing authorities on standards of fitness under section 352 of the Housing Act 1985" - issued May 14th 1992 - ISBN 0-11-752640-1
Insulation	The ability of a product (e.g. door) to resist or restrict the passage of conducted heat. Products are tested to a specific insulation performance under BS 476 : Part 22 : 1987.
Integrity	The ability of a product or construction to remain intact and not permit flames or hot gases to pass through it by way of holes, cracks fissures etc. Products/constructions are tested to a specific integrity performance under BS 476 : Part 22 : 1987
Intumescent (material)	Material which swells to several times its original volume when subjected to heat. Provides fire stopping and insulating properties. Usually of volcanic origin.
MICC	Mineral Insulated Copper Cable (also known as Pyro) - See Section 8, Page13, Paragraph 11.3.

NICEIC	National Inspection Council for Electrical Installation Contracting
Nuisance alarms	Alarm condition in an AFD system not caused by a genuine fire - may result from poor system design, occupier behaviour or a fault in the system
Periodic test report	An electrical report on the existing wiring installation that can be required in a number of circumstances : By an enforcement officer when concerned about the state of the electrical installation As a result of a recommendation by an electrical inspector at the time of a previous inspection At regular intervals as recommended in the IEE Regulations or appropriate British Standard e.g. every 5 years in the case of AFD installation
Pictogram	A diagram conveying a message without the use of words
Plasterboard	A board of gypsum plaster enclosed between and bonded to two paper sheets. Defined in BS 6100 : 1990
Primary gas meter	A meter connected to a service pipe or service pipework for ascertaining the quantity of gas supplied through that pipe or pipework. **NB** A service pipe is a pipe for supplying gas to premises from a distribution main, being any pipe between the distribution main and the emergency control nearest upstream to the primary meter.
Pyro	See MICC
Repeater Indicator Panel	A duplicate panel in an AFD system serving a second or subsequent main entrance to a building. Will contain all visual and audible warning signals, zone indications etc. but may not contain control equipment which will be housed in the main panel. Installed so that if Fire Fighters enter through that entrance they will have the necessary information presented immediately to them.
Responsible Person	A person appointed or authorised by the property owner or person having control of the property for a particular purpose e.g. to supervise and carry out routine checks of an AFD system.
Risk analysis	An exercise to determine the level of risk of suffering death or injury in the event of fire based upon a range of criteria - see Section 9, Pg.2, 2.0.
Room sealed appliance	An appliance whose combustion system is sealed from the room in which the appliance is located and which obtains combustion from a ventilated uninhabited space within the premises or from the open air outside the premises and which vents the products of combustion to open air outside the premises
Secondary gas meter	A meter, other than a primary meter, for ascertaining the quantity of gas provided by a person for use by another person whether or not there is also a primary meter in respect of the gas supplied. The secondary meter is normally a room meter

Self-contained units	The Circular 12/92 meaning relates to traditional bedsits as opposed to hostels. The meaning within this guide relates to conversion flats in single occupation with all amenities behind the front door
Soffit	Underside of staircase, balcony, architrave, arch etc.
Stand-by supply	Battery power to AFD or lighting systems which cut in if mains power fails
Suitably qualified person	See Competent Assessor
Test Report	See Fire Test report
Trained traffic	Occupiers of a building who are familiar with its layout and configuration and who could be expected to navigate to final exit without additional information
UKAS	United Kingdom Accreditation Service - a service of the National Physical Laboratory.
UKAS registered testing house	A laboratory or testing facility accredited by UKAS to carry out testing of products under rigidly controlled conditions and strict quality assurance criteria
Voids	Unused empty spaces within a building.
Wallboard	British Gypsum trade name for plasterboard

BIBLIOGRAPHY

DEPARTMENT OF THE ENVIRONMENT AND HOME OFFICE GUIDANCE

The current HMO Code of Practice	Circular 12/92 Houses in Multiple Occupation : Guidance to Local Housing Authorities on Standards of Fitness under Section 352 of the Housing Action 1985
The current edition of the IEE Regulations	16th edition of the Institute of Electrical Engineers (IEE) Regulations (also known as BS 7671 : 1992)
Building Regulations 1991:-	
Approved Document B	Fire safety
Approved Document N	Glazing materials and protection

LEGISLATION

The Health and Safety (Safety Signs and Signals) Regulations 1996

The Gas Safety (Installation and Use) Regulations 1972

The Gas Safety (Installation and Use) Regulations 1994

BRITISH STANDARDS

BS 476 :-	Fire tests on building materials and structures
BS 476 : Part 6 : 1981/1989	Method of test for fire propagation of products
BS 476 : Part 7 : 1971/1987	Method for classification of the surface spread of flame of products
BS 476 : Part 8 : 1972	Test methods and criteria for fire resistance of elements of building construction (general principles)
BS 476 : Part 20 : 1987	Method for determination of the fire resistance of elements of construction (general principles)
BS 476 : Part 21 : 1987	Methods for determination of the fire resistance of loadbearing elements of construction
BS 476 : Part 22 : 1987	Methods for determination of the fire resistance of non-loadbearing elements of construction
BS 476 : Part 23 : 1987	Methods for determination of the contribution of components to the fire resistance of the structure

BS 476 : Part 31:-	Methods for measuring smoke penetration through doorsets and shutter assemblies
BS 476 : Part 31.1 : 1983	Method of measurement under ambient temperature conditions
BS 1635 : 1990	Recommendations for graphical symbols and abbreviations for fire protection drawings
BS 2911: 1974 (1980)	Specification for letter plates
BS 4533 :-	Luminaires
BS 4533 : Part 102 :-	Particular requirements
BS 4533 : Section 102.22 : 1990	Specification for luminaires for emergency lighting
BS 4678 :-	Cable trunking
BS 4678 : Part 4 : 1982 (1988)	Specification for cable trunking made of insulating material
BS 4790 : 1987	Determination of the effects of a small source of ignition on textile floor coverings (hot metal nut method)
BS 5266 : -	Emergency lighting
BS 5266 : Part 1 : 1988	Code of practice for the emergency lighting of premises other than cinemas and certain other specified premises used for entertainment
BS 5268 :-	Structural use of timber
BS 5268 : Part 4 : 1990	Fire resistance of timber structures
BS 5287 : 1988	Specification for assessment and labelling of textile floor coverings tested to BS 4790
BS 5306 :-	Fire extinguishing installations and equipment on premises
BS 5306 : Part 3 : 1985	Code of practice for selection, installation and maintenance of portable fire extinguishers
BS 5378 :-	Safety signs and colours
BS 5378 : Part 1 : 1980	Specification for colour and design
BS 5395 :-	Stairs, ladders and walkways
BS 5395 : Part 1 : 1977 (1984)	Code of practice for the design of straight stairs
BS 5395 : Part 2 : 1984	Code of practice for the design of helical and spiral stairs
BS 5395 : Part 3 : 1985	Code of practice for the design of industrial type stairs, permanent ladders and walkways
BS 5445 :-	Components of automatic fire detection systems
BS 5445 : Part 5 : 1977 (EN54 : Part 5)	Heat sensitive detectors - point detectors containing a static element
BS 5445 : Part 7 : 1984 (EN54 : Part 7)	Specification for point type smoke detectors using scattered light, transmitted light or ionization

BS 5445 : Part 8 : 1984 (EN54 : Part 8)	Specification for high temperature heat detectors
BS 5446 :-	Components of automatic fire alarm systems for residential purposes
BS 5446 : Part 1 : 1990	Specification for self contained smoke alarms and point-type smoke detectors
BS 5499 :-	Fire safety signs, notices and graphic symbols
BS 5499 : Part 1 : 1990	Specification for fire safety signs
BS 5588 :-	Fire Precautions in the design, construction and use of buildings
BS 5588 : Part 1 : 1990	Code of practice for residential buildings
BS 5725 :-	Emergency exit devices
BS 5725 : Part 1 : 1981	Specification for panic bolts and panic latches mechanically operated by a horizontal push bar
BS 5839 :-	Fire detection and alarm systems for buildings
BS 5839 : Part 1 : 1988	Code of practice for system design, installation and servicing
BS 5839 : Part 2 : 1983	Specification for manual call points
BS 5839 : Part 3 : 1988	Specification for automatic release mechanisms for certain fire protection equipment
BS 5839 : Part 4 : 1988	Specification for control and indicating equipment
BS 5839 : Part 6 : 1995	Code of practice for the design and installation of fire detection and alarm systems in dwellings
BS 5872 : 1980	Specification for locks and latches for doors in buildings
BS 6099 :-	Conduits for electrical installations
BS 6099 : Section 2.2 1982 (1988)	Specification for rigid plain conduits of insulating material
BS 6206 : 1981	Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings
BS 6387 : 1983 (1991)	Specification for performance requirements for cables required to maintain electric circuitry under fire conditions
BS 6459 :-	Door closers
BS 6459 : Part 1 : 1984	Specification for mechanical performance of crank and rank and pinion overhead closers
BS 6575 : 1985	Specification for fire blankets
BS 7352 : 1990	Specification for strength and durability performance of metal hinges for side hanging applications and dimensional requirements for template drilled hinges
BS 7671 : 1992	Requirements for electrical installations. IEE Wiring Regulations. 16th edition

BS 7863 : 1996	Colour coding to indicate the extinguishing media contained in portable fire extinguishers
BS 8214 : 1990	Code of practice for fire door assemblies with non-metallic leaves

BRITISH STANDARDS COMBINED WITH EUROPEAN STANDARDS

BS EN 2 : 1992 (previously BS 4547)	Classification of fires
BS EN Parts 1-6 : 1996 (previously BS 5423)	The manufacturing standard for portable fire extinguishers
BS EN 1154 :	Draft European standard for controlled door closing devices - requirements and test methods
BS EN 12209 :	Will shortly replace BS 5872 : 1980

DRAFT EUROPEAN STANDARDS

EN 1154	Will shortly replace BS 6459 Part 1 : 1984 (covers self closing devices)
EN 1838	Draft European standards for emergency lighting illuminance in escape routes

OTHER STANDARDS

DDI 171 : 1987	Guide to specifying performance requirements for hinged or pivoted doors (including test methods)

INDUSTRY CODES OF PRACTICE

ABHM Code of Practice 1993	Hardware essential to the optimum performance of fire-resisting doorsets
GIA Code of Practice 1993	Architectural Ironmongery suitable for use on fire resisting self closing timber and emergency exit doors

OTHER REFERENCES

LFCDA Fire Guidance Note Number 48	Electro-magnetic door holders
Menvier Guide	Design handbook "Emergency lighting and fire detection systems"

USEFUL ADDRESSES

The names, addresses and telephone numbers in this list are not exhaustive, but include the sponsors of this guide, together with those independent bodies, manufacturers, trade associations and fire consultants who, in some way, contributed towards its compilation.

INDEPENDENT BODIES

Chartered Institute of Environmental Health.	Chadwick Court, 15 Hatfields, London SE1 8DJ Tel. No : 0171-928-6006
London Fire and Civil Defence Authority. (LFCDA)	London Fire Brigade, Fire Safety Department, Queensborough House, 12-18, Albert Embankment, London SE1 7SD Tel. No : 0171-587-4877
Building Research Establishment	Bucknalls Lane, Garston, Watford, Hertfordshire WD2 7JR Tel. No : 01923-894040

MANUFACTURERS

ABEL Alarm Company Ltd.	Head Office : 4 Vaughan Way, Leicester LE1 4ST Tel No : Freephone 0800-160160
AEI Cables Ltd.	Durham Road, Birtley, Chester-Le-Street County Durham, DH3 2RA Tel. No : 01914-103111
Apollo Fire Detectors Ltd.	36, Brookside Road, Havant, Hampshire, PO9 1JR Tel No : 01705-492412
British Gas, Transco. (Southern Area)	Brockham House, Dorking Business Park, Dorking, Surrey RH4 1HJ Tel. No : 01306-748500
British Gypsum Ltd.	East Leake, Loughborough, Leicestershire LE12 6HX Tel. No : 0115-9456123
Cape Boards Ltd.	Iver Lane, Uxbridge, Middlesex UB8 2JQ Tel. No : 01895-237111

Chubb Fire Ltd.	Chubb House, Sunbury-on-Thames, Middlesex, TW16 7AR Tel. No : 01932-785588 Free call 0800-321666
Datwyler (U.K.) Ltd.	Such Close, Works Road, Letchworth Hertfordshire SG6 1JF Tel. No: 0802-386444
Delta Special Cables Ltd.	Manston Lane, Crossgates Leeds LS15 8SZ Tel. No : 01132-321616
DORMA Door Controls Ltd.	DORMA Trading Park, Staffa Road, Leyton, London, E10 7QX Tel. No : 0181-558-8411
English Heritage	Fortress House, 23 Saville Row, London W1X 1RB Tel No : 0171-973-3000
John Carr Ltd.	Watch House Lane, Doncaster, S. Yorkshire, DN5 9LR Tel. No: 01302-783333
Josiah Parkes & Sons Ltd.	Union Works, Gower Street, Willenhall, West Midlands WV13 1JX Tel. No : 01902-366931
Menvier. **(Electronic Engineers) Ltd**	Southam Road, Banbury, Oxon, OX16 7RX Tel. No : 01295-256363
Notifier Ltd.	Charles Avenue, Burgess Hill West Sussex RH15 9UH Tel. No : 01444-230300
NT Door Controls Ltd.	Bescot Crescent, Walsall, West Midlands WS1 4NF Tel. No : 01922-38101
Nullifire Ltd.	Torrington Avenue, Coventry CV4 9TJ Tel. No : 01203-855000
Pilkington **(United Kingdom) Ltd.**	Prescot Road, St Helens Cheshire WA10 3TT Tel No : 01744-28882
Promat Fire Protection Ltd.	Meldreth, Nr. Royston, Hertfordshire SG8 5RL Tel. No : 01763-262310
Quelfire Ltd.	PO Box 35, Caspian Road, Altringham Cheshire WA14 5QA Tel. No : 0161-928-7308
Rockwool Ltd.	Pencoed, Bridgend, Mid Glamorgan CF35 6NY Tel. No : 01656-862621

Sealmaster Ltd.	Brewery Road, Pampisford, Cambridge CB2 4HG Tel. No : 01223-832851
Sensotec Europe Ltd. **(FIREX)**	Unit 7, Industrial Estate, Bala, Gwynedd LL23 7NL Tel. No : 01678-520022
Signs and Labels Ltd.	Latham Close, Bredbury Industrial Park, Stockport, Cheshire SK6 2SD Tel. No : 0161-494-6125
Stocksigns Ltd.	Ormside Way, Holmethorpe Ind Estate, Redhill, Surrey RH1 2LG Tel. No : 01737-764764
3M United Kingdom PLC.	3M House, PO Box 1, Market Place, Bracknell, Berkshire RG12 1JU Tel. No : 01344-857042

TRADE ASSOCIATIONS

Architectural and Specialist Door Manufacturers Association. (ADSMA)	3, Coates Lane, High Wycombe, Buckinghamshire, HP13 5EY Tel No : 01494-447370
Association of Builders Hardware Manufacturers. (ABHM)	Heath Street, Tamworth, Staffordshire B77 7JH Tel. No : 01827-52337
Association for Specialist Fire Protection (ASFP)	Association House, 235 Ash Road, Aldershot, Hampshire GU12 4DD Tel. No : 01252-21322
British Fire Protection Systems Association. (BFPSA)	48A, Eden Street, Kingston Upon Thames, Surrey KT1 1EE Tel. No : 0181-549-5855
CERTIFIRE Ltd.	101, Marshgate Lane, London E15 2NQ Tel. No : 0181-555-3234
Fire Accreditation Scheme (FIRAS)	Holmesfield Road, Warrington, Cheshire WA1 2DS Help Line : 01925-630438
Fire Resisting Glass and Glazed Systems Association. (FRGGSA)	Secretariat : 20, Park Street, Princes Risborough, Buckinghamshire, HP27 9AH Tel. No : 01844-275500
Glass and Glazing Federation. (GGF)	44-48, Borough High Street, London SE1 1XB Tel. No : 0171-403-7177
Guild of Architectural Ironmongers. (GIA)	8, Stepney Green, London E1 3JU Tel. No : 0171-790-3431

Intumescent Fire Seals Association. (IFSA)	Secretariat : 20, Park Street, Princes Risborough, Buckinghamshire, HP27 9AH Tel. No : 01844-275500
Timber Research and Development Association. (TRADA)	Stocking Lane, Hughendon Valley, High Wycombe, Buckinghamshire HP14 4ND Tel No : 01494-563091

UKAS REGISTERED TESTING HOUSES

Chiltern International Fire Ltd. (Formerly known as : TRADA)	Chiltern House, Stocking Lane, Hughendon Valley, High Wycombe, Buckinghamshire HP14 4ND Tel No : 01494-563091
Faverdale Technology Centre Ltd.	Faverdale Industrial Estate, Darlington, County Durham DL3 0PX Tel. No : 01325-381220
The Building Test Centre.	East Leake, Loughborough, Leicestershire LE12 6NP Tel. No : 0115-945-1000
The Loss Prevention Council.	Melrose Avenue, Borehamwood, Hertfordshire WD6 2BJ Tel No. : 0181-207-2345
Warrington Fire Research Centre	Holmesfield Road, Warrington, Cheshire WA1 2DS Tel. No : 01925-655116

FIRE CONSULTANTS

Highfield Consultancy Services. Contact : Norman England	84 Windsor Road, Maidenhead, Berkshire SL6 2DJ Tel. No : 01628-(6)30179
International Fire Consultants. Contact : Peter Jackman	20 Park Street, Princes Risborough, Buckinghamshire HP27 9AH Tel. No : 01844-275500
Parryfire. Contact : Lin Parry	3, Coates Lane, High Wycombe, Buckinghamshire HP13 5EY Tel. No : 01494-462094

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