LONDON METROPOLITAN UNIVERSITY

H&S Standard: Fire Doors

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1. Fire Door – Introduction

This guidance note is concerned with the identification, requirements, and inspections of fire doors. It is intended to assist staff within the Estates and Facilities and Projects, whose responsibilities it is to help ensure that fire doors carry out their functions; to protect escape routes from the effects of fire so occupants can safely reach a final exit and/or to protect the contents and structure of a building by limiting the fire spread.

1.1 Identifying Fire Doors

Identifying fire doors is not straightforward. However, this advice note will assist in establishing where fire doors are required and identifying the fire doors within university buildings which need to be maintained and subject to regular inspection regimes.

1.2 Fire Door Ratings

Fire ratings for fire door assemblies are given in minutes and prefixed by the letters FD standing for “fire door”, thus FD30 equates to a 30-minute (1/2 hour) fire door or door set.
The suffix ‘S’ indicates that cold smoke seals are fitted.

The most commonly specified integrity levels are:

FD30 - 30 minutes fire resisting with intumescent strips located within the frame or around the door leaves on both sides and the top. These doors are normally 45mm in thickness.

FD60 – 60 minutes fire resisting with intumescent strips located within the frame or around the door leaves on both sides and the top. These doors are normally 54mm in thickness and must have intumescent gaskets located behind the hinges, and gaskets around the locks.

The performance of a fire resisting “doorset” is only as good as the weakest component and it is therefore essential that every part of the assembly contributes to the required level of performance.

A full door set includes:

- The door leaf (or leaves for double leaf doors)
- Frame (also termed the door lining)
- Fire door signs
- Intumescent seals
- Cold smoke seals
- Essential ironmongery
- Non-essential ironmongery
- Vision panels/Glazing

2. Where are fire doors required?

Fire doors are generally required in the following locations:

- Doors to kitchens also to tea points which are in protected escape routes.
- Doors to service ducts and risers because of fire spread to other floors of the building.
- Doors to workshops, storerooms, and plant rooms as these are high risk areas.
- Doors to laboratories (based on level of risk presented by the use of laboratory- if the use is deemed high fire risk then a door should be fitted).
- Mid-corridor doors which form a compartment or an extension to a fire escape route.
- Doors leading onto staircase from corridors or rooms, with the exception of toilets.
- Doors to circulation areas which extend the escape route from the stair to the final exit or to a place of safety, entrances, and lobbies.
- All doors leading onto external fire escapes (except the door at the top of the fire escape).
- Doors between basement levels and staircase to upper floors.

2.1 (30) Minute fire doors

In most situations a 30-minute fire door (FD30) should be installed. The door may require cold smoke seals. Locations for 30-minute fire doors requiring smoke seals (FD30 S) to be fitted:

- Any door enclosing a protected staircase (escape staircase).
- A protected lobby approach to a stairway or corridor.
- All doors serving protected corridors and in particular corridors serving sleeping accommodation (bedrooms).
- A door enclosing a protected shaft forming a lift or service shaft/riser.
- Doors to corridors connecting alternative exits. These are mid-corridor doors and should be in every corridor more than 12m long connecting two or more storey exits. The doors should be mid-way between the two storey exits.
- Doors in dead end (escape in one direction) portions of a corridor.
- Locations for 30-minute fire doors NOT requiring smoke seals (FD30) to be fitted:

- A door forming an enclosure to a place of special fire risk.
- A door to a lift shaft that does not form a protected shaft.

- A door giving access to an external escape route except the door from the top storey.

- Any door within ac cavity barrier i.e. a fire compartment break within the fire separation.

- Any door forming a protected entrance hall or protected landing in a flat.

- In a compartment floor e.g. loft door.

2.2 (60) Minute fire doors

The following locations will require a 60-minute fire door requiring smoke seals to be installed.

- Doors to fire-fighting lobbies where there is a fire-fighting lift or shaft.

- Doors to service ducts and risers if the wall is of 120-minute fire resistant construction.

- Doors within fire resisting compartment walls of 120-minute fire resistance or more. Please note: the fire door should be half the rating of the wall.

In a fire compartment wall separating buildings.

Some fire doors may need to be of an extra fire rating to the above i.e. a door enclosing a protected shaft forming a lift or service shaft will need to be half the period of fire resistance of the walls in which it is fitted but a minimum of FD30.

It is possible that FD60 doors have been installed where only an FD30 is required- if this is the case there is no need to downgrade or change, but where an FD30 has been where and FD60 is required this must be changed and upgraded.

3. Door leaves and gaps

There are many ways of manufacturing the door but the most common for mass produced doors is wood frame in-filled with flaxboard and faced with plywood. The usual cause of fire door break down in a fire situation is distortion of the leaf and the main advantage of flaxboard construction is that the door does not contort easily during a fire. Laminated timber, solid joinery and particleboard cores can also perform well but each manufacturer's product behaves differently.

The gap between the door and the frame is extremely important and must be suitable for the intumescent seal fitted. In general, the gap should not exceed 3mm along the 2 long edges and across the top of the door leaf. The gap at the bottom of the door is usually around 10mm (check the manufacturer's instructions) for non-smoke conditions but 3mm when smoke seals are required.

3.1 Door frames

For FD30 doors, a good quality softwood frame is usually adequate providing it is of suitable thickness to bear the weight of a fire door leaf. A minimum of 32mm finished thickness is recommended, although frames as thin as 25mm can be used for lightweight leaves.

For FD60 doors, a frame manufactured from dense hardwood is essential due to the slow charring rate. A typical softwood frame would be expected to burn through in less than 60minutes and this should be borne I mind in refurbishment work where the existing frames are to be retained.

Doorstop size is immaterial: there is no longer a requirement for 25mm stops.

There may be instances where some fore doors are not made of wood but metal. If you are not completely sure of the integrity of such doors, please contact the University Fire Safety Advisor (FSA).

3.2 Fire Door Signs

All fire doors MUST be marked with appropriate fire safety sign in accordance with BS5499 (2013). The sign should be 80mm x 80mm in size and fitted at eye level to one or both sides of the door.

Fire doors to cupboards and service risers should be marked on the outside with the appropriate fire door sign: all other fire doors will require appropriate signs on both sides of the door.

Signs, Colour and Pictograms	Description, Uses and Conventions
	Identifies a **Fire Door** fitted with a self-closing device that **MUST** always be kept shut and unobstructed. Signs are positioned at eye level on both faces of each leaf of self-closing fire doors. **Note**: *door may be signed "Fire Door Keep Closed" or similar*
	Identifies a **Fire Door** that **MUST** always be kept shut – *no self-closer fitted to the door requiring it to be locked shut to provide an effective fire barrier.* Signs are positioned at eye level on both faces of each leaf of self-closing fire doors. Used on fire doors for example to cleaner's cupboards, storerooms, plant rooms or service risers etc.
	Identifies a fire door that is held open by an electromagnetic hold open device, which to be effective must always be kept clear and unobstructed. Any obstruction may impede the door closing action or shutter when released by activation of the fire alarm. AFDKC signs are positioned at eye level on door leaf facing into corridor or room, with a "Fire Door Keep Shut" sign fitted on door leaf that faces the wall or partition when door is in the hold open position.

There are many other signs which may be displayed on fire doors. If you are unsure, please refer to the relevant legislation for further guidance or contact the University Fire Safety Advisor.

4. Intumescent strips

Intumescent strips are designed for minimising the possibility of door edges being penetrated by fire and should be fitted to all fire doors as standard. An intumescent strip is applied to the edges of the door (with the exception of the bottom edge) so that a rise in temperature will cause the material to swell and close the gaps.

The intumescent strip, about 3mm thick by 10mm wide, is cut into a groove in the door or the frame edge and is normally white or brown in colour. As soon as the temperature in the vicinity of the strip exceeds 150^{o}C it swells and seals the gaps sealing the door onto the frame.

There may be occasion where the fire door requires an intumescent grill to be placed within the door leaf to give ventilation to an area, for example a server room where ventilation is required to keep the room cool. Any ventilation grill proposed must be approved by the University Fire Safety Advisor (FSA) before installation. In the event of a fire and if the temperature reaches certain high levels, the grill- that incorporates a honeycomb style mesh- will seal to stop any hot gases or smoke being transmitted to/from the room cupboard. Where grills have been previously installed, they should be checked to ensure they are of the correct type i.e. intumescent.

5. Cold Smoke Seals

In most circumstances, retention or control of smoke is also required. Where this is so, fire door installations can be fitted with appropriate smoke seals. These prevent the leakage of air (and therefore smoke) through the most vulnerable places i.e. gaps between door and frame, glazed openings and where appropriate, letter plates. See section 2.2 above for doors that require smoke seals.

Installations fitted with such seals are designated by the suffix ‘S’ after the integrity rating i.e. FD30S meaning door has 30 minutes fire resistance with smoke seals for the retention of smoke.

Cold smoke seals come in the form of a brush or rubber strip which should be in the same location as the intumescent strips on three sides of the door or within the door frame. It is preferred that all new smoke seals are brush type and not rubber strip type as the rubber strips are not as durable and long lasting in maintenance terms a brushes.

6. Self-Closing Devices

6.1 Selection of the correct size door closer

The following points will all have an impact on which door closing device to use. It is essential to ensure the most suitable door closer is fitted to doors. Manufacturers’ information should be able to provide information on suitability.

The width of the door is the main consideration in determining the correct size closer.

Size here refers to the minimum spring power and hence the closing force, generated by the closer.

- Door size.
- Weight of the door.
- Environment conditions, which include wind, draughts, pressure differentials, which may be in place in the building.
- Typical user strength

6.2 Door closing devices

All fire doors should be fitted with a self-closing device except for doors to cupboards and to service ducts/riser cupboards which are normally kept locked shut.

6.3 Door hold open devices

It is possible to hold open certain fire doors with either a fusible link, automatic release mechanism or a door closer delay device. Some more of the common methods for hold open devices are described below.

All door hold open devices should be regularly released as part of a routine; for example, the magnets in hold open devices can become stuck together of not regularly released. Every hold open device should also be tested as part of the weekly fire alarm test in the building to ensure they perform.

Electromagnetic door hold open devices can hold fire doors open using magnets which are linked to the fire alarm system. On activation of the fire alarm system the magnetic devices will release allowing the doors to close via the self-closing device.

Some hold open devices are incorporated into the self-closing device which is also linked to the fire alarm system and automatically release the doors on fire alarm activation.

7. Dorgard

A Dorgard is a device that can be used in certain locations and is a self-contained unit which is installed onto the fire door and is battery operated. It allows the fire door to be held open via a rubber stop. It operates by identifying a high decibel sound such as the fire alarm system which releases the rubber stop. Once activated it released the door which will close via self-closing device. There is limitation where a Dorgard unit can be used and consultation with the University Fire Safety Advisor (FSA) should be sought before installing a Dorgard or similar device. Fixed alternatives should be investigated in preference to fitting of such devices.

Fire doors may only be held open by devices that are certifies to relevant guidance.

8. Electronic locking & break glass units

The installation of electronic locking or means of securing doors on exit routes, between different occupancies or on final exit doors not in normal use can be used. It includes electronic locks and strike plates (electro-magnetic devices), electromagnets and mag locks (electro-magnetic devices).

Electro-magnetic devices are normally installed at the top of doors and their frames. Any form of security device installed in a fire door should not reduce its fire resistance below the requirements of the relevant enforcing authority. Surface mounted devices are unlikely to cause significant problems unless fixing screws, bolts, etc., penetrate deeply into the door structure. Fixings which pass through the door are unacceptable.

Electro-magnetic devices normally fail safe in the open position on operation of the fire alarm system and on the loss of power as the magnetic force is lost.
Care should be taken that any floating plate arrangement does not include locating pins or lip as an external force on the door may prevent it from parting.

A break glass unit, identifiable by being coloured green or a commercial emergency control device should be connected so that it will cut the power supply directly to the door lock without reliance on a relay.

All doors fitted with electromagnetic door security locking systems need to be released as part of the fire alarm activation in order to ensure they perform.

Fire doors should not be fitted with locks that cannot be opened by either electronic means or manual push bars.

9. Ironmongery

Essential ironmongery in fire doors includes hinges, closers and latches that are required for the door set to work. In general, they should not be manufactured from low melting point materials.

Remove the minimum amount of timber when fitting ironmongery. For FD60 or higher ratings, the use of intumescent gasket beneath hinge blades and around latch bodies is essential.

Non-essential ironmongery includes spy holes, letter plates, locks including digital locks and similar items that can be overlooked when designing for fire resistance. Most perforate the door and some can interfere with internal strength within the leaf. Check suitability before installing on site.

Non-essential ironmongery are items not typically required on fire-resisting doors for them to function, whereas essential ironmongery is required din all cases - -e.g. door closers.

10. Vision panels

Vision panels are provided for many reasons. One of the benefits of vision panels is that they can aid people to see into a room through the doors during an evacuation or an incident without having to always open the door. This is especially convenient in the event that the door is locked, and the keys are not immediately available. Whether in a mid-corridor door or a door to a room, a vision panel should not be covered with any posters, coats, signs, or any other materials.

All doors to circulation areas, corridor doors, and stair enclosures must be fitted with vision panels. I the case of doors to laboratories and other areas where chemicals or other hazardous materials are used, vision panels reduce the possibility of an accident occurring due to collision.

If a vision panel or glazing is required in a fire door then the glazing must be fire resisting glazing of 30/60 minutes integrity (FRG30/60) meeting the relevant guidance.
It is very important to be able to identify clear fire-resisting glazing. This is identified by an acid etching with the trade name in the corner of the pane marked BS 476 Part 22. If the acid etched trade name or BS 476 Part 22 information is not visible, then the glazing will not be accepted as FRG30 and must be replaced.

Georgian wired type fire resisting glass is not normally marked in any way but should be 6mm minimum in thickness.

It is essential that all fire resisting in glazed windows, doors, borrowed lights or fanlights, are permanently fixed shut and do not contain mechanical ventilators or other openings.

If a vision panel or glazing is required in a fire door or partition, then the glazing must be Fire Resisting Glazing of 30/60 minutes integrity (frg30/60) meeting the relevant guidance.

11. Register of fire doors &inspection periods

As with any fire safety component, a fire door and its components should be regularly checked to ensure it functions properly. Most of the time a fire door is used like any other door and is subject to wear and tear. The building and surrounding environment can also change and affect the door. Any slight alteration to the door or its surroundings can affect the performance of the door in a fire situation.

The university, via estates, has a legal responsibility to ensure fire doors are subject to a suitable system of maintenance and are maintained in an efficient state, proper working order and in good repair. A register of all fire doors must be produced preferably using a unique numbering system. All defects and remedial works must be recorded on the associated record sheets.

The university’s planned preventative maintenance (PPM) regime requires designated fire doors to be serviced at regular intervals.

All maintenance staff and supervisors undertaking or inspecting fire door PPM’s should receive appropriate training, in addition to Project Coordinators who need to inspect fire doors on completion of a project.

Any defects with the fire doors reported to estates should be regarded as urgent tasks and repaired within the shortest possible timeframe.

Any defects on fire doors which prevent opening of fire exit doors on escae routes from occupied areas should be reported immediately to the Health and Safety team in addition to Estates and the occupants of the area. If required, the occupancy and use of the area(s) affected may be impacted until the issue has been resolved.