

Shropshire Fire and Rescue Service

Fire Safety Advice Sheet

Upgrading Doorsets to provide Fire Resistance

Introduction

Fire doors are essential elements in providing protection to occupants of a building by creating safe evacuation routes, and preventing the products of combustion such as smoke, poisonous gases and flames from entering the escape routes. The location, type, number and construction of fire doors will depend upon the use to which a building is put, the protection required for Relevant Persons and the layout of the escape routes themselves. This should all be considered within your fire risk assessment, and guidance can be found in the government's guides to the Regulatory Reform (Fire Safety) Order 2005 (RR(FS)O)– see below.

With new fire doors now costing as little as £30 to £40 pounds, there is little financial incentive to create a fire resisting barrier by upgrading existing doors, however, there are some circumstances where this method may be desirable or necessary. In premises that are listed buildings, those that have non-standard door sizes or are of particular architectural importance, the cost or availability of suitable fire doors may cause problems.

In some circumstances, it may be possible to upgrade existing solid or substantial doors to provide a level of fire resistance that can provide the necessary minimum period of protection to allow people to safely evacuate in the event of a fire (usually 30 minutes). When considering upgrading an existing door, it will be necessary to seek advice from a suitably qualified and competent person and you should discuss your intentions with our fire safety department before undertaking any work. This advice sheet discusses some of the issues that you will need to consider.

The fire resisting doorset concept

A fire resisting door should more accurately be referred to as a fire resisting doorset (FRD), since the door and its frame act together to resist the passage of fire, heat and smoke.

The FRD is designed to act as both a door and a barrier to the products of combustion, by containing a fire within the room of origin and slow or resist its development or spread. Its primary purpose is to prevent a risk to life by allowing sufficient time for people to evacuate to a place of safety, without putting them at risk, but an FRD will also

help to minimise the effects of a fire within the premises or the business they contain and may perhaps allow them to continue to function after a fire.

The fire resistance of an FRD is also dependant upon other factors which include:

- The door must be closed when a fire breaks out. This may involve the fitting of some form of self-closing mechanism.
- The method of securing the door to the frame (hinges and latches) must be suitable for the weight of the door and be capable of remaining in place when attacked by extremes of heat. Fire doors should be hung using three hinges, two of which should be within the upper third of the door and rated at 800°C, far above those found on non-fire doors.
- Any glazing either within or around the door (e.g. vision panels, fanlights, or glazed doors themselves) must be fitted with fire resisting glazing installed to manufacturers specifications and properly sealed with intumescent materials.
- FRD's should have no holes or other openings e.g. where a lock has been removed, and doors should fit tightly and securely into their frame. The recommended gap between the door and frame is between 2mm - 4mm, with the gap between the bottom edge of the door and the floor not exceeding 8mm. The frame should be strongly fixed to the wall and sealed using fire resisting mastics or similar.
- The provision of heat activated intumescent strips and flexible edged cold smoke seals across the head of the door and down both sides.

When considering the provision of FRD's under your fire risk assessment, it is strongly recommended that new, properly tested fire doorsets are used. The upgrading of existing doors should only be considered in exceptional situations, and often this proves to be more expensive than buying new.

Are my doors suitable for upgrading?

The Timber Research and Development Association (TRADA) offer some advice on the suitability of doors for upgrading, and this is précised below, along with a simple checklist which may assist in your decision making.

Checklist	Response
What period of fire resistance is required?	
What is the door construction? (see table below)	
Is the door in good condition without cracked timber?	
Is the door a good fit in the frame? (see above)	
Is the door at least 44mm thick over its whole area?	
Is the door of solid timber throughout?	
Are all the joints between the door components well fitting, firm and tight?	
Has animal glue been used in the joints?*	
Is the frame in good condition and without cracked or split timber?	
Is the frame well secured to the wall?	
Are there any gaps between the frame and the wall (and behind the architrave)?	

Is there glazing in, around or over the door and frame?	
If there is a fan light, does it open?	
Is it worthwhile upgrading the FRD or is a replacement a more effective alternative?	

* Animal glues will soften very quickly when exposed to extremes of heat, and will need reinforcing with mechanical fixtures.

Type of door	Comments	Is upgrading possible?
Unframed, hollow core, flush	Too light & insubstantial	No
Framed, hollow core, flush	Depends on strength of framing	Possibly
Framed, solid core, flush	When core is of cork, flaxboard, timber or chipboard	Yes
Framed, ledged and braced	One side upgrading possible	Yes
Framed, solid with solid panels	Depends on thickness (min 44mm)	Possibly
Framed, solid with glass panels	Depends on thickness (min 44mm)	Possibly
Firecheck/smoke stop doors		Yes
Ledged and braced	Substantial alterations required	No
Sandwich construction	Depends upon materials and type of construction	Possibly

*Firecheck/smoke stop doors are fire doors tested to give 20 minutes fire resistance, where as FRD's should be a minimum of 30 minutes fire resistance.

Methods of upgrading existing FRD's

There is a variety of methods that can be used to upgrade FRD's, but amongst the most common are:

1. Splitting the door and sandwiching a fire resisting material in the centre.
2. Applying a fire resistant material to one or both sides.
3. Correctly applying an intumescent material in the form of a paint or varnish to one or both sides of a door, in accordance with the manufacturer's specification.

Where any FRD is created through upgrading, you should ensure that a certificate is provided by the competent person undertaking the work detailing the method and materials used, as proof of its performance in fire. This is in place of the usual manufacturer's mark found on new, purpose made fire doorsets.

Smaller premises

In some smaller premises, it may be possible that existing solid construction doors can be acceptable without further upgrading to the construction, but with the inclusion of a robust self closing device and heat and smoke seals, providing they conform to one of the construction methods where upgrading is confirmed (see table above). This should be supplemented with the addition of a good fire warning and detection system (see our advice sheet AS 24/2008) as necessary. You should refer to the government's guidance documents for the RR(FS)O for further guidance.

Sources of information and advice

There are a number of trade and professional associations that are able to provide technical advice on upgrading doorsets, as well as building professionals. For further advice you can contact or consult any of the following:

- Your architect, designer or surveyor.
- A competent and experienced carpenter or builder.
- Your Local Authority Building Control Department or an Approved Inspector for new builds and alterations to existing premises.
- Planning and Conservation Departments at your Local Authority for listed and historic buildings.
- Timber Research and Development Association (TRADA) – 01494 569601
- Fire Resisting Glazing Group – 0845 257 7973
- Pilkington Glass Ltd – 01744 692000 or www.pilkington.com
- Intumescent Door Seals Association – www.ifsa.org
- The Building Regulations 2000 – Approved Document B: Volume 2 – Buildings other than dwellinghouses.
- British Standard BS 476: Part 22 – Test methods for the fire resistance or elements of building construction.
- Government guidance documents for the Regulatory Reform (Fire Safety) Order 2005 (available at www.shropshirefire.gov.uk)

Or by telephoning Shropshire Fire and Rescue Service on 01743 260260.