

# **Regulatory Reform** **(Fire Safety) Order 2005**

## **ASDMA Guidance Notes for Responsible Persons**

This document has been prepared by ASDMA (Architectural & Specialist Door Manufacturers Association) to provide guidance for Responsible Persons in respect of fire rated timber doors.





# Regulatory Reform (Fire Safety) Order 2005

This document has been prepared by ASDMA (Architectural & Specialist Door Manufacturers Association) to provide for guidance for 'Responsible Persons' in respect of fire rated timber doors.

Buildings are compartmented to delay the spread of fire from one area to another. The compartments are usually linked by doors to allow for the passage of 'traffic' around the building.

**Doorsets have two important functions in a fire:**

- **When closed they form a barrier to fire spread.**
- **When open they provide a means of escape.**

## Spread of Fire:

Doorsets will generally be a weak point in any fire barrier because their primary function is to allow 'traffic' to pass from one side of a wall to the other.

Some doors are dedicated fire doors and are marked as such, but all doors will form a barrier against the spread of fire between compartments provided the door is in the closed position. It is important for doors to be kept closed when not in use, to maximise their potential performance under fire conditions.

Dedicated fire doors should be fitted with 'Fire Door Keep Shut' signs that should be visible from either face of the door.

**NOTE: Refer to BS5499 & 5378 for approved sign designs.**



Experience shows that convenience often takes precedence over safety and building users may seek to disable or otherwise undermine devices that inconvenience them in carrying out their work. Doors are often held open by wedges or fire extinguishers so that the building users, particularly if they are moving loads, can pass easily around the building.

All dedicated fire doors (except duct doors) should be fitted with automatic closing devices. To be effective these must be capable of closing the door from any angle of opening and should be strong enough to overcome the resistance of any latch or sealing system.

**ASDMA recommends** that consideration is given to user convenience and that provisions are made to safely provide for ease of use of a building. Various devices may be used in conjunction with closing devices to achieve this objective:

- **Fusible links:** These use a low melt temperature component to hold doors in the open position. In the event of fire the fusible link melts and allows the door to close under closer control. They are low cost products but are not smoke sensitive and will not operate until the temperature at fusible link reaches the operating temperature.

**NOTE: These devices do not sense the presence of smoke and are not recommended by ASDMA for this reason.**

- **Swing Free Closers:** These exert no forces on a door leaf during normal operation. They may include internal sensors or be linked to the fire alarm system. When activated by the sensor system (or in the event of power failure) the closer system shuts the door in an identical manner to a normal closer.



- **Electro Magnetic Hold Open Devices:** The door is fitted with a normal closer that applies forces to close the doors. The doors are held open by an electro magnet fitted to the wall or floor and a metal plate fitted to the door. The electro magnet is linked to a 'command' system that may be the fire alarm system. In the event of a fire or power failure the electro magnets release and the door closes under the closer power.



**NOTE 1: Electro magnetic hold open devices must be carefully positioned so that the hold open force is applied at the same level as the closer. For overhead closers, the electro magnetic hold open devices should be near the head of the door, and for floor mounted closers, they should be positioned near the bottom.**

**NOTE 2: ASDMA recommends that all doors operated by swing free closers or electro magnetic hold open devices are linked to command systems that allow for daily operation of the doors. Thus the doors may be held open during the working day but closed (eg by a timing device) when the building is not in use or during periods of reduced occupancy.**

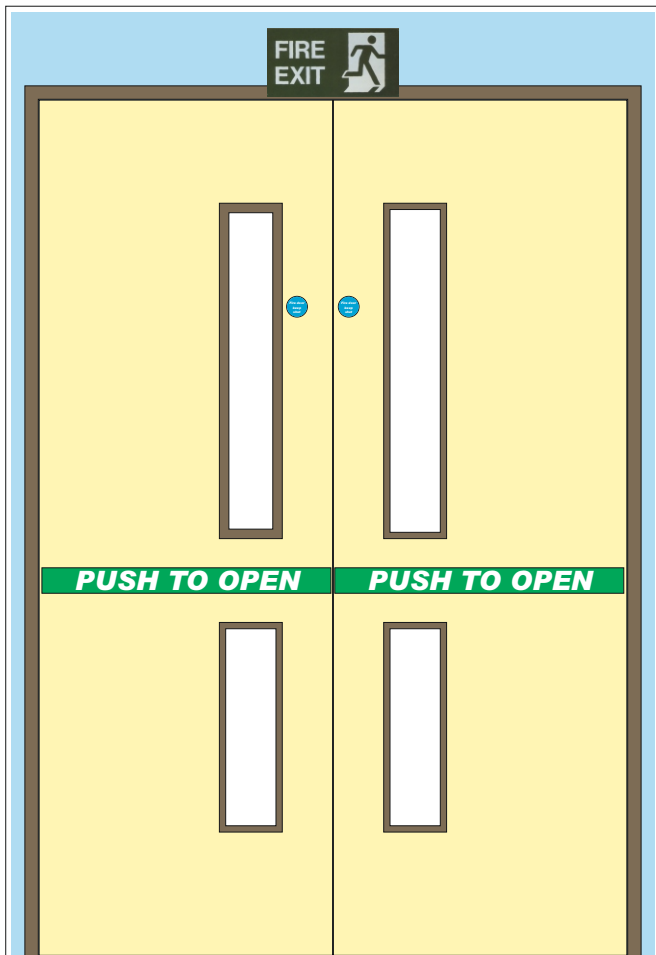
**NOTE 3: The area around doorways must not be used for storage or any other purpose that may prevent doors from closing in the event of fire.**

**Means of Escape:**

In the event of fire it is important that relevant persons are aware of escape routes and can use them freely. Escape routes should be clearly marked, and may include emergency lighting.

Where possible, escape doors should open in the direction of the escape (ie push to open).

There may be a conflict between security, energy conservation and escape requirements. Escape fire doors should not be locked but may be fitted with emergency release fittings which can override the security devices in the event of fire. For most applications crash bars or emergency release pads can be fitted to the closing face of the door to prevent access from the opening face. More sophisticated systems include the use of electrically powered locks or strike plates that may be linked to the fire alarm system. Operation of doors should be kept as simple as possible. Complicated devices are more likely to be vulnerable to wear or failure over time.



**NOTE 1:** Simple surface mounted escape devices can be fitted to existing installations. They must have been successfully tested to BS476 Pt.22 or BS EN 1634-1 to the required level of fire performance with a timber doorset and must be fitted strictly in accordance with the hardware supplier's fixing instructions.

**NOTE 2:** More complicated devices e.g. electric strikes or electric locks must not be added to existing timber doorsets. These usually require the removal of significant parts of the leaf or frame and can reduce the fire performance of the doorset.

**NOTE 3:** Timber doors rely on the core structure for their fire performance. Hardware that requires significant areas of the door leaf or frame to be removed should not be retro fitted to existing doorsets. Metal components should not be fitted in a way that creates a thermal bridge to transfer heat from one face of the door to the other eg. metal plates that wrap around door leaf edges.

**NOTE 4:** Escape routes and doorways must be kept clear of obstructions that might prevent the doors operating or create an obstacle to escape from the building emergency conditions.

**NOTE 5:** Final escape doors can be fitted with closers that operate or fail safe to open.

### Identifying Fire Doors:

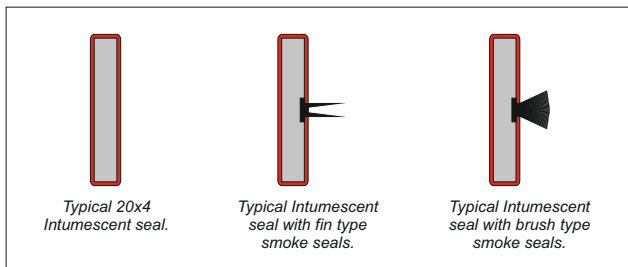
Responsible door manufacturers label their doors. This will identify the manufacturer, the date of manufacture and the design fire rating of the door type. They may fit a colour coded plug instead of, or in addition to, the label. Identification labels are usually fitted on the top or hanging edge of the door and plugs in the long edges.

**NOTE 1: The plug colour codes for fire doors are given in BS8214.**

**NOTE 2: For Hospitals, fire doors display a disc at the top of each face of the door showing the design fire performance (see HTM58).**

Identification marks are sometimes removed during installation (during adjustment of the assembly) or may be painted over.

All dedicated fire doors providing a half hour performance or greater performance will be fitted with intumescent seals. These may be encased in a PVC sheath (of any colour) which may also hold a blade or brush seals for smoke sealing purposes. These seals are fitted in the door leaf edges or the frame to seal the head and long edges of the assembly.



Exceptionally, a door may be fitted with a concealed intumescent system where the long edge sealing is housed under lippings. Intumescent seals should be visible at the head of the door.

Intumescent seals expand under heating to seal the gaps between the door leaf and the frame (and at the meeting stiles of pairs of doors).

Not all intumescent material act in the same way. Low pressure seals expand in all directions but provide little help to the door in resisting distortion under fire. Some high pressure seals exert pressure mainly in one direction and provide some resistance to distortion of the door leaf under fire. A further type of pressure intumescent material, available in different grades, acts in all directions and generates some pressure.

**NOTE: Fire seals activate at temperatures that are above human survival levels.**

Doorsets using 44mm thick doors fitted with 10~15mm wide intumescent seals are likely to be FD30 (half hour) doorsets. When used with 54mm thick doors using at least 20mm width of intumescent seal, (fitted either as one or two strips) the design performance for the doorset is likely to be FD60 (one hour).

Doorsets with a rating in excess of FD60 (one hour) are rarely used on escape routes or to protect people but may be found where property protection is important (eg data storage areas where documents cannot be removed in the event of fire). Some of these doors have the appearance of timber, but may be constructed with a mineral core material. Expert assistance may be required to identify such doorsets.

### Smoke Sealing:

Smoke and fumes from a fire can be as dangerous as fire itself. The appearance of smoke may be the first warning of a fire and dense smoke conditions can lead to disorientation and panic.

An open doorway provides an easy route for the flow of smoke under fire conditions. Any door which is closed will restrict the passage of smoke, it is therefore recommended that all doors should be kept closed when not in use.

Where smoke sealed doors need to be held open for the convenience of the users of a building, the use of door control systems that can be activated by a smoke alarm are recommended. Some closing devices are available with built in smoke sensors, others can be linked to alarm systems. Electro magnetic hold open devices can also be linked to smoke alarm systems.

Most dedicated fire doors in public buildings are provided with smoke seals. The smoke seals may be integral with the intumescent seal as illustrated or, may be fitted separately.

**NOTE: Smoke seals are low cost items. ASDMA recommends that all doors are fitted with simple smoke seals that do not interfere with the operation of the doors and that will provide for a secondary energy conservation and sound attenuating functions.**

**Maintenance of Fire Doors:**

Fire doors are engineered products that provide life and property saving functions in the event of fire. It is important that they are regularly inspected and maintained to permit them to perform at their best on the one and only occasion when they are called upon to do so.

Doorsets fitted with hold open devices or swing free type closers should be closed daily, particularly overnight when there is likely to be low building occupancy. For busy 24/7 buildings (eg hospitals) fire doors should be closed at least weekly. All fire doors should close effectively from any angle of opening using only the door closer.

**NOTE: There are a number of reasons why doors may fail to close. Check that there are no foreign bodies or other objects obstructing the door. Check that any smoke seals are correctly fitted and are undamaged. Check the latch (if fitted) to ensure correct operation and that it is suitably lubricated. Only as a last resort, should the closing device be adjusted, but this must be carried out carefully to ensure that the doors can be opened without undue force.**

Intumescent seals should be checked regularly (at intervals not greater than 6 months) and damaged or missing seals replaced.

**NOTE: To maintain the design performance potential, replacement seals should be of the same brand, size and type as the original. However, any intumescent seal of the same size as the original fit is better than none.**

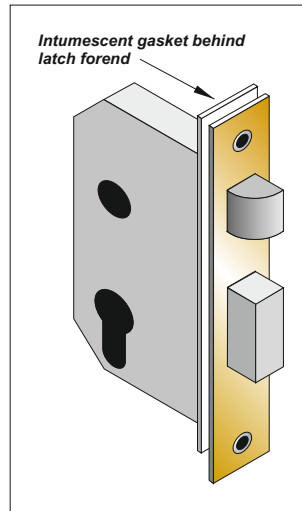
Mechanical items such as hinges, locks, latches, closers, floor springs etc. are likely to wear over time. Maintenance provisions should comply with the hardware suppliers' recommendations where these are known. Otherwise, locks and latches may require occasional light lubrication.

**NOTE: Some hinges use self lubricating bearings that will not need additional lubrication.**

Where it is necessary to replace worn hardware on a fire door, the essential items listed above should be replaced with products to the same specification as the original where possible. Otherwise hinges, latches, locks, flush bolts, closers and other items of load bearing or securing hardware should be of the same type and size as the original items and should have been proven for use in timber fire rated doorsets of the required performance.

**NOTE: Hardware that has been successfully tested in metal doorsets may not be suitable for use with timber doorsets.**

Redundant hardware should be carefully removed. Intumescent gaskets may have been used under hinge

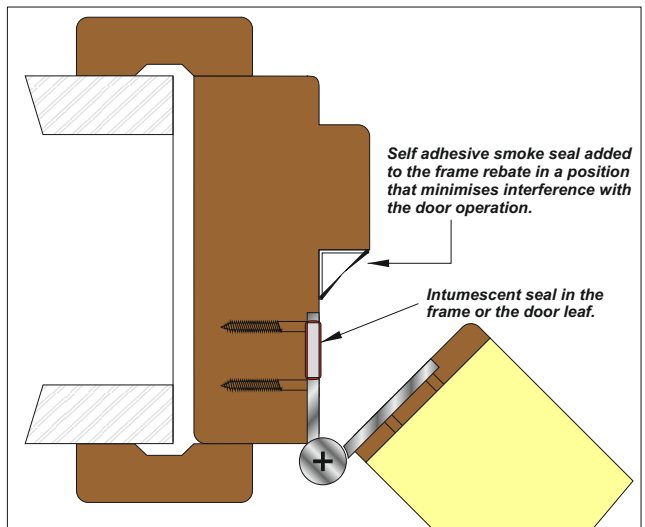


blades, lock/latch forend plates and strike plates, with some closer fittings and in flush bolt recesses. These gaskets should be replaced if possible with gaskets of the same material. Otherwise they should be retained and reused with the new fittings if they are undamaged.

**NOTE: Intumescent gaskets (or mastics) used for these applications are usually the low pressure type.**

**Smoke Seals:**

Smoke seals, particularly those which are fitted in the intumescent seal carrier, may become damaged over time. It is not necessary to replace the complete intumescent and smoke seal. If the intumescent seal is still in a serviceable condition, separate smoke seals can be added to the doorset. It is recommended that replacement or additional smoke seals are of a type that fits into the frame rebate in a position where they have minimal influence over the operation of the door. These seals generally have self adhesive backing to allow for ease of fitting in existing installations.

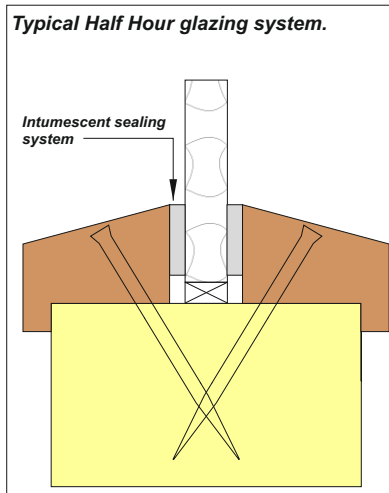




**Maintenance of Fire Doors continued:**

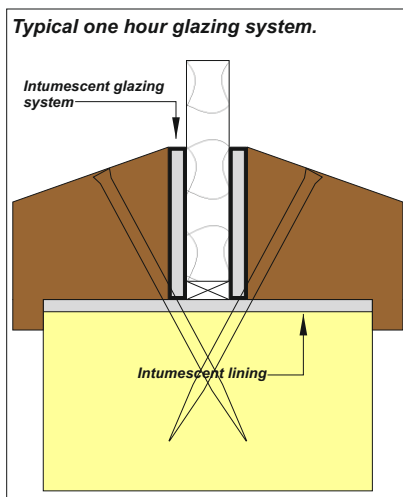
The glass in glazed fire rated doors may need to be replaced from time to time due to accidental damage.

Glazing for fire rated timber doors requires a suitable combination of glass type, beading system and intumescent sealing system.



The glass type may vary according to the fire performance requirements. The beading system, including the bead profile, with its intumescent components must be suitable for use with the particular door construction and glass type.

The most commonly used glass is 6mm Georgian wired glass. Other clear special glasses may be used and thicker, laminated glass may be encountered in doors where full insulation is required.



The re-glazing of fire rated doors involves techniques which require the skills of a qualified glazier.

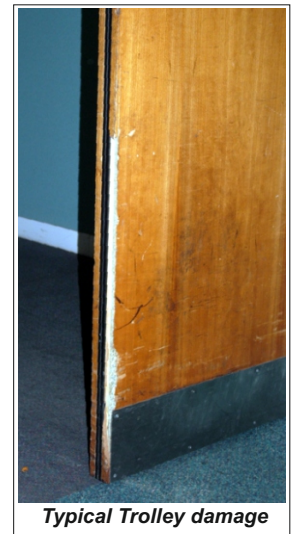
When re-glazing a fire door, the beading and damaged glass should be carefully removed and the glass, intumescent sealing system and beading replaced using

identical products to the original. The position, angle and size of fixings to secure the beading is important. These should be recorded when removing the damaged glass and replicated when refitting the beading.

**Care of Fire Doors:**

Fire doors provide a vital safety function in the event of fire and must be treated with care.

A major cause of damage to fire doors is abuse resulting from the opening doors using trolleys of various types.



ASDMA recommends the following action to address this problem:

- User education. Ensure all users of the building are aware of the function of the fire doors and the need to treat them with care.
- Where doors need to be kept shut for safety, security or energy conservation reasons, consider fitting delayed action closers. These allow the doors to be opened manually and to stay open for a short time (enough to allow a trolley or bed to go through the opening) before closing.
- Where doors can be left in the open position; closers with a hold open facility, either within the closer or by the use of separate or electro magnetic hold open devices linked to the fire alarm system may be used.

**NOTE 1: Where doors are held open, doorways must be kept clear of anything that might impede the closing of the doors or the escape of people from the building.**

**NOTE 2: ASDMA recommends that doors on hold open devices are closed on a daily basis.**

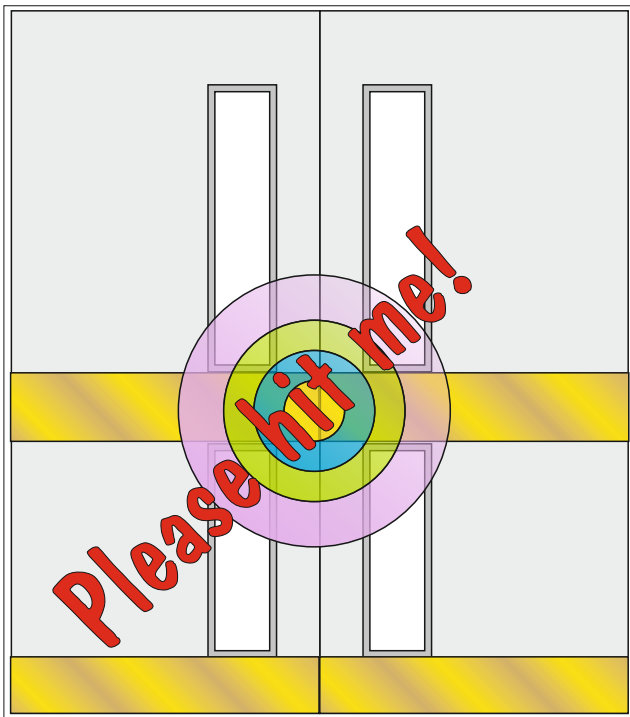
- Use route markers on the floor or other methods to encourage users to approach doors at a 90° angle.
- Fit buffer systems to the trolleys to soften the impact on the doors. The buffer system should extend all round the sides of the trolley to prevent the doors closing onto a trolley after the buffer system has passed the door.

**Care of Fire Doors continued:**

The following action is **not recommended**:

- Fitting of metal plates to door faces. This does little to protect the vulnerable edges of the door and large metal plates may give rise to excessive distortion and consequent performance failures under fire conditions. If metal plates extend around the edges of a timber door, they may form a thermal bridge under fire conditions leading to performance failures.

**NOTE 1: The use of protection plates of any type may invite abuse.**



**NOTE 2: If protection plates are deemed to be essential, they are available in high impact plastics using mixes that incorporate fire retardant salts.**

- Hardware items that require the removal of parts of the door core can cause the same thermal bridging as metal plates around door edges and so should not be fitted to existing doors.
- Smaller items of hardware can usually be face fixed to fire doors without detriment to their performance. eg door fixed items for electro magnetic hold open devices or faced fixed closers with fittings that do not pass through the thickness of the door leaf.
- The addition of glass apertures to existing fire rated flush door installations is **not** recommended.

**Replacement and Additional Doors, Doorsets and associated materials:**

It may be necessary to replace damaged door leaves or doorsets and in some cases, to install additional fire rated doorsets following a risk assessment. ASDMA members specialise in the manufacture of bespoke performance doors and doorsets manufactured to suit customer defined requirements. Associate members can supply many of the doorset related materials and components referred to in this document.

For further information please refer to the ASDMA web site [www.asdma.com](http://www.asdma.com)  
**Responsible Persons are invited to contact the ASDMA technical advisory service Tel: 01494 447370 for further assistance.**

For further information please refer to the **'Best Practice Guide to Timber Fire Doors'** by reference to the ASDMA web site: [www.asdma.com](http://www.asdma.com)