Buyers Guide
FIRE PROTECTION
2021

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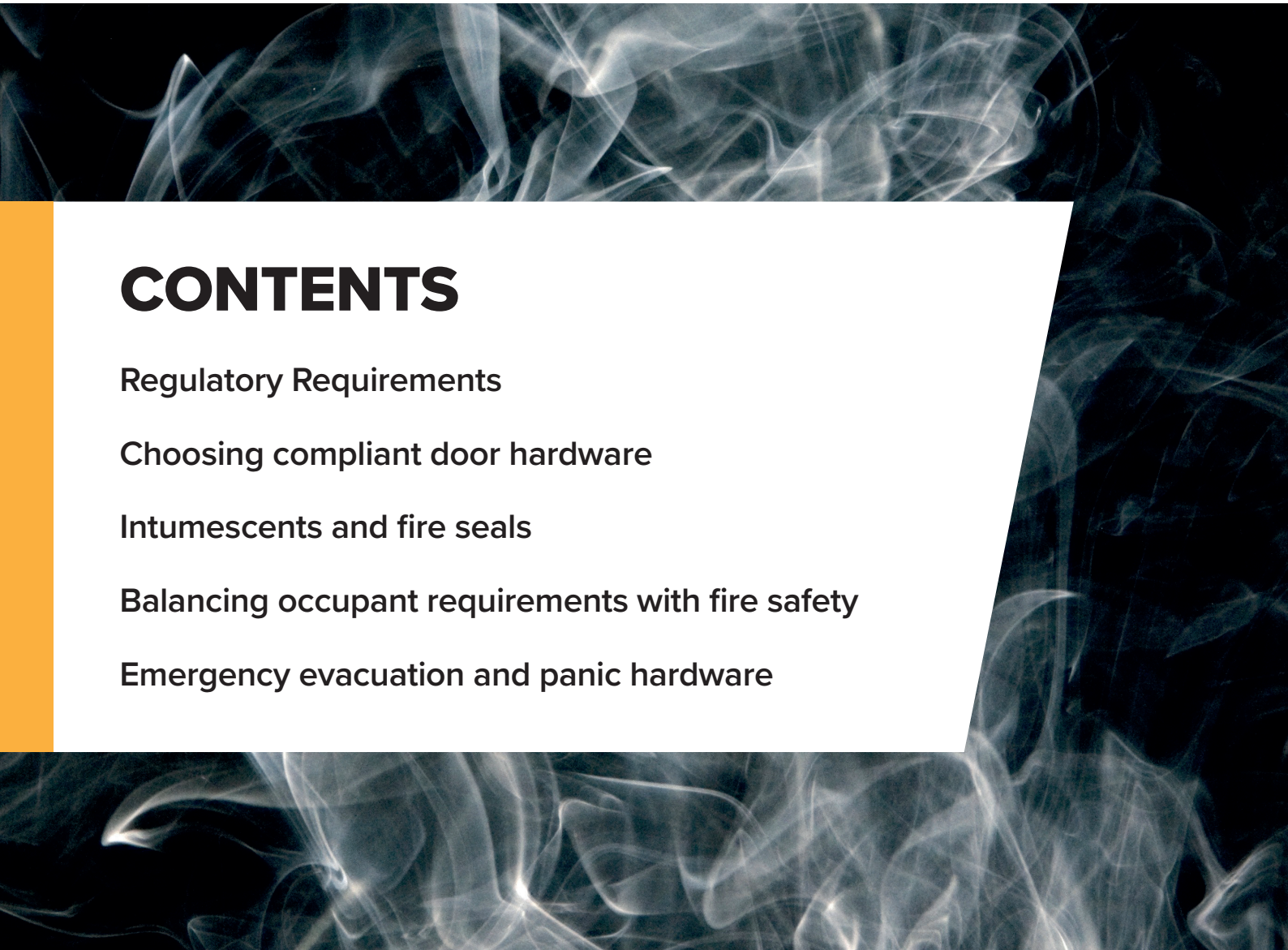
Specifying the appropriate fire door hardware for buildings is an important part of fire prevention. An effective fire door can slow the initial development of a fire, slow the spread of the flames and protect escape routes. It's therefore vital that door closers, hinges, latches and seals are not overlooked and fitted correctly to ensure the door's performance isn't hindered in order to help protect property and save lives.

Similarly, the correct selection of door handles, levers and emergency exit hardware will help ensure that in the event of a fire, the building occupants can evacuate safely and quickly. In this guide, we look at what is required under the regulations and how those responsible for the building can ensure it is both safe and meets the other needs of occupants.



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REGULATORY REQUIREMENTS

FIRE DOORS

In England and Wales, Approved Document B (Fire safety) of the Building Regulations provides guidance and standards on all aspects of the building, including requirements for fire doors. These are reflected in the equivalent sections of the regulations in Scotland (Section 2) and Northern Ireland (Part E). Each requires fire doors to be fitted with a self-closing device that will fully and reliably close the door from any angle, overcoming the resistance of a latch or any seals fitted.

However, door closers fitted to fire doors must still allow doors to be opened easily during normal use. The Equality Act 2010 states that physical features of a building, including fixtures, fittings and equipment, must not restrict access to people with disabilities. Approved Document M in England and Wales, Section 4 in Scotland and Part R in Northern Ireland, all require that a 'door set' (which includes all door hardware) produces an opening force of below 30 Newtons (N) between 0° and 30° and below 22.5N beyond 30°.

In addition, when fire doors are propped or wedged open they provide no protection, so the regulations also require that fire doors be clearly marked with a safety sign such as 'Fire door keep shut' to remind people not to prevent it from closing. At IronmongeryDirect we have a wide range of safety signage, including fire door signs.

DOORS ON ESCAPE ROUTES

The regulations also require that all doors that form part of the escape route (whether or not they are fire doors) should not impede the evacuation of the building. This means that the doors either have to be fitted with no lock, latch or bolt fastenings, or if they are fitted, the fastening has to be simple. These should fulfill all the following requirements:

- **It should be apparent how to undo the fastening**
- **Operable from the side approached by people escaping**
- **Operable without a key**
- **Operable without requiring people to manipulate more than one mechanism**

REGULATORY REFORM (FIRE SAFETY) ORDER 2005

The Regulatory Reform (Fire Safety) Order 2005 (or RRO) applies to most non-residential properties, including offices, shops, pubs, clubs, restaurants, hotels, schools and care facilities, such as hospitals and care homes. It requires that the 'responsible person' must take reasonable steps to reduce the fire risk and ensure people can evacuate safely in the event of a fire. The responsible person is any person who has some level of control over the premises, such as the employer, building manager or building owner. It is the duty of the responsible person to ensure that a fire safety risk assessment is carried out. This includes:

1. **Identify fire hazards**
2. **Identify people at risk**
3. **Evaluate, remove or reduce and protect from risk**
4. **Record findings, formulate an emergency plan, inform and instruct the relevant people and provide training**
5. **Review and update the fire risk assessment regularly**

Therefore, it is the responsible person's duty to make sure that the hardware on fire doors and escape route doors, as well as other fire protection measures, function correctly.

We have created a Fire Door Checklist of the factors that need to be considered when inspecting fire doors:
www.ironmongerydirect.co.uk/fire-door-checklist

CHOOSING COMPLIANT DOOR HARDWARE

There are a wide range of door hardware options that will help to achieve compliance with the regulations and prevent the spread of smoke and flame in the event of a fire.

DOOR CLOSERS

There are a range of factors that need to be considered when selecting a door closer for a fire door, such as the weight and width of the door, level of traffic through the door and the type of building. Our handy Door Closer Guide can help you make the right choice for your project, **www.ironmongerydirect.co.uk/door-closer-guide**

The selected door closer should comply with BS EN1154 for Controlled Door Closing Devices and be CE marked to this standard. It is also important to look for CERTIFIRE Approved fire doors and door closers. Fitting a non-approved product to a CERTIFIRE door will invalidate the certification. Once installed, the door set should be tested to make certain it closes reliably from any angle.

To ensure the door set also meets the requirements of the access regulations it may be advisable to look for a closer that allows the power to be adjusted on site. For example, the CERTIFIRE approved, medium duty **Arrone**® AR3500 Door Closer can be fitted to interior and exterior doors up to 1100mm wide or 80kg and has a 120-minute fire rating. It is also adjustable and meets the BS 8300 standard for accessibility.

HINGES

Fire doors should have at least three hinges and these should be CE marked to BS EN 1935. It is important to ensure the hinges are suitable for the application and are the correct grade for the type of door. This can be determined by looking at the 8-digit code on the hinge:

Digit 1: **Category of Use**
(light to severe duty)

Digit 2: **Durability**
(number of test cycles: 10k, 25k or 200k)

Digit 3: **Door mass**

Digit 4: **Suitability for fire/smoke door use**
(0 for unsuitable and 1 for suitable)

Digit 5: **Safety**
(confirms it meets basic safety requirements)

Digit 6: **Corrosion resistance**
(from grade 0 no defined resistance to grade 4 very high)

Digit 7: **Security**
(suitable for burglar resistant door assemblies - 0 or 1)

Digit 8: **Hinge grade**
(1 to 14 denotes the usage, durability and door mass).

For example, our Twin Ball Bearing Fire Door Hinge is BS EN 1935 Grade 14. It has a 60-minute fire rating and is suitable for fire doors up to 160kg. It is also rated for severe duty applications, has very high corrosion resistance and has been tested up to 200,000 cycles.

LATCHES AND HANDLES

The latches and handles must also be selected carefully to ensure compliance. As stated above, fitting a non-CERTIFIRE approved component to a CERTIFIRE door will invalidate the certification, so checking for this approval is one of the primary considerations when selecting latches. It is also essential that the fire rating for the latch supports the rating of the door set as a whole. For example, if a door set with a 60-minute fire rating is required, fitting a latch that only has a 30-minute rating would undermine the performance of the door assembly. In addition, the design of the latch must ensure it will reliably secure the door, so a positive return action from the latch spring is essential. Finally, as with all door hardware it must be suitable for the application and the level of use it will need to withstand.

For example, the **Altro** Heavy Duty Tubular Latch is CERTIFIRE approved and CE marked. It has a 60-minute fire rating and the heavy double spring ensures positive and secure return while the design ensures the latch locates quietly into the keep.

It is also important that it meets accessibility requirements. The handle must be easy to operate by everyone using the building and therefore it is recommended that any product that is chosen that complies with BS8300.

As an example, the **Altro** 19mm Return to Door Lever Handle is made from 304 grade stainless steel for low maintenance longevity. The Return to Door design of the crank ensures it complies with BS 8300, making it ideal for public environments.

INTUMESCENTS AND FIRE SEALS

To protect a building from risk, fire resisting doors and walls must provide a complete barrier against the flames and, where required, smoke. Therefore, fire doors must fit tightly against the frame but still open and close correctly under normal use. The Building Regulations provide a maximum gap that is allowed around the door and requires thermally activated intumescent seals to be fitted. When exposed to heat, these seals expand to fill the gap around the door and resist the movement of smoke and fire.

In certain areas of the building, such as protected sections and stairwells, the doors also must have smoke seals. These are either solid ‘flippers’ or brushes designed to stop the smoke moving past the door. There are a range of options available including seals that include both a smoke seal and an intumescent element. For example, the **Sealmaster** Intumescent seals, that feature a flipper smoke seal and intumescent element, or the **Pyroplex** Fire & Smoke Intumescent Strip that has a brush pile to stop the passage of smoke.

Furthermore, intumescent seals should also be fitted under CE marked fire door hinge leaves, to comply with the marking requirements. These pads should be fitted to the door and frame under each hinge leaf. The thickness of the required seal will depend on if it is a 30- or 60-minute fire door. With our Intumescent Pad packs, you simply install one pad under each leaf for FD30 doors and two for FD60 doors.

In addition, allowing sufficient ventilation and the free movement of air through a building is an important consideration to ensure the health and comfort of occupants. However, vents in walls and doors as well as ventilation ducts can provide a passage for smoke and fire, limiting the effectiveness of protective measures. Therefore, intumescent elements should also be installed in these areas. As with the door seals, these expand when exposed to the heat of the fire to seal the vent. It is important that the selected intumescent vent has the same fire rating as the door or wall they are fitted to. For example, the CERTIFIRE approved **Lorient** LVV40 Intumescent Air Transfer Vent can be fitted in a door or wall and has a 60 minute fire rating.

Similarly, where there are holes, joins or seams in a fire resisting wall, such as around pipe and service penetrations or between floors and walls, intumescent acrylic sealants such as **Soudal** Firecryl FR can be used. This can be applied in a range of interior areas, including on porous surfaces and is fire rated up to 4 hours in compliance with EN1366.

BALANCING OCCUPANT REQUIREMENTS WITH FIRE SAFETY

In some types of building, there may be a need to adapt to the specific needs of occupants or the way the building will be used, while still meeting fire safety standards. For example, in hospitals where beds and wheelchairs need to be moved through the building frequently, self-closing doors may disrupt or hinder normal operations. Also, in schools and colleges, at certain times of the day, such as during classroom changes, there will be a large number of people moving about the building. Here self-closing doors will impede the smooth movement of staff and students. It will also mean the door closer mechanism will be operated more frequently, increasing wear and tear.

A possible solution is selecting a door closer with a delayed action feature, such as the **Rutland**® TS9205, to allow more time for people to pass through before the door begins to close. It is also power adjustable and compliant with BS 8300.

An alternative is to select a hold-open device that will keep the door open until a fire alarm is triggered, at which point it releases the door to close under the force from the door closer. For example, the standalone, wireless **Agrippa** Magnetic Door Holder, which as a 200N holding force, will detect a continuous fire alarm sound and release the door to close using a standard closer. It can also be programmed simply to the sound of the alarm in the building to prevent false activations. It can be manually released if needed and has the option for automatic timed closing, such as at night, and fails-safe by releasing the door if the battery runs low.

A further option is an automatic door closer with a free swing function, such as the **GEZE** TS4000EFS Electromagnetic Door Closer. It features a ‘free swing’ function that enables the door to be opened and closed with minimal force, but the electro hydraulic mechanism ensures a safe automatic closing of the door when there is a loss of power or a fire alarm is triggered. This is ideal for allowing easy movement through a building, particularly where people may have reduced mobility or muscle strength, such as care facilities or hospitals.

As doors fitted with these mechanisms will close immediately in the event of a fire, the other hardware that is fitted must allow easy evacuation. As an example, if the door is on an escape route and features a latch mechanism, it must also be fitted with the appropriate panic hardware, as detailed in the next section.

EMERGENCY EVACUATION AND PANIC HARDWARE

To ensure fire safety and compliance with the regulations, exterior doors on escape routes must be simple to operate from the direction of escape without keys. Panic hardware allows easy and fast opening of exit doors; however, the selected product must be suitable for the environment.

Push pad exit hardware conforming to EN179 can only be used in buildings such as low occupancy offices that are not accessed by the public, where all occupants can be trained to use the exit. There are a range of push pad devices for both double and single doors in timber, uPVC and metal, and with different locking options. As an example, the **Briton** 372 Single Door Push Pad features a vertical bolt and an anti-thrust device to prevent unauthorised retraction of the latch bolt. **Pyroplex** Fire & Smoke Intumescent Strip that has a brush pile to stop the passage of smoke.

For publicly accessible buildings such as schools, hospitals, shops and cinemas, the mechanism must be simple to operate for those unfamiliar with the building. Therefore, it must comply with BS EN 1125 to ensure *“safe and effective escape through the doorway with minimum effort and without prior knowledge of operation”*. BS EN 1125 compliant devices feature push bar mechanisms, such as the **Briton** 376 Single Door Panic Bolt . The unit is operated by a downward thrust of the cross bar to give a speedy exit in panic situations. An adapter for use with a rim cylinder for outside access is also supplied as standard.

Door hardware has an essential role in supporting the fire safety strategy of the building. Selecting the correct products will help ensure that fire doors operate as intended, to stop the spread of the fire and protect escape routes from smoke and flames. Also, ensuring the right hardware is chosen for doors on escape routes will allow building occupants to evacuate quickly and easily in an emergency.

To find out more about our range of fire protection products and fire regulation compliant door hardware visit: **www.ironmongerydirect.co.uk**