

# IRONMONGERY FOR FIRE AND ESCAPE DOORS GAI SPECIFIER'S GUIDE

*The specifier's guide to the importance of fire and escape doors and how to correctly specify architectural ironmongery for them.*

# IRONMONGERY FOR FIRE AND ESCAPE DOORS

## GAI SPECIFIER'S GUIDE

Based on the RIBA Approved CPD of the same name, the specifier's guide to Ironmongery for Fire and Escape Doors covers the importance of fire and escape doors and how to correctly specify architectural ironmongery for them.

To ensure that your project meets the latest standards, regulation, legislation and best practice, it is strongly recommended that the ironmongery should be specified by a GAI Registered Professional such as a Registered Architectural Ironmonger (RegAI). All RegAI's have successfully completed the GAI Diploma in Scheduling qualification, and continue to maintain and update their knowledge through the GAI continuing professional development (CPD) programme. RegAI status is a clear demonstration of professional competence in matters which are critical to building safety, accessibility and security. Visit [www.gai.org.uk/RegAI](http://www.gai.org.uk/RegAI).

If you would like to receive a presentation of the CPD, this is available through GAI member companies. Please visit the GAI website ([gai.org.uk](http://gai.org.uk)) for more details.

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# 1. THE IMPORTANCE OF FIRE DOORS

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Fire safety in all buildings is of paramount importance. Building designers, architects, inspectors and owners all must play a part in ensuring that the building and its occupants are safe in the event of a fire.

Fire doors form a big part of the building's passive fire protection system tasked with compartmentalising a fire, protecting property and avoiding the potentially tragic consequences of serious injury or death.

## WHAT IS A FIRE DOOR?

Buildings are divided into "compartments" by fire-resisting walls, ceilings and floors. A fire door protects an opening in a fire wall, and has the same level of fire resistance as the wall, e.g. 30 or 60 mins.

When the fire door is closed, it can:

- stop any fire and smoke spreading.
- provide a safe and protected escape route while people evacuate the building.
- provide some protection for fire-fighters entering the building.

Fire doors must be installed to replicate their tested condition, and if you make any changes to them in any way, you are likely to negatively affect their fire performance, and certainly nullify any 3rd party certification or CE/UKCA mark.



*External side of fire door after fire*



*Internal side of fire door after fire*

## 2. TYPES OF FIRE DOORS

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There are three types of fire doors identified as follows:

**Fire Door Keep Shut** - Doors which are self-closing, and used for passage of people. A self-closing fire door can also be useful where it's also used for privacy (interview room), or security (wages office). These signs must be fitted to both sides of the door.

**Fire Door Keep Locked** - Doors which are locked shut. These doors are only used occasionally and if no closer is fitted it must have the appropriate signage i.e. fire door keep locked which is to be fitted to one side of the door.

**Automatic Fire Door Keep Clear** - Doors which are held open, or swing-free, but which revert to self-closing as soon as the fire alarm sounds - in corridors, a fire door can be a nuisance. Hold open devices which are connected to the fire alarm system are allowed, as long as they are properly maintained but they must revert to self-closing when the fire alarm sounds. One type of door closer allows the door to swing freely and easily in normal use, giving open access to the elderly and disabled. It reverts to self-closing when the fire alarm sounds.



*Fire door keep shut*



*Fire door keep locked*



*Automatic fire door keep clear*



# 3. TYPES OF FIRE DOOR HARDWARE



## ESSENTIAL HARDWARE

Certain items of ironmongery (door hardware) are essential to a fire door's performance. They vary from door type to door type, but can include:

- Hinges (or pivots) to hang the door.
- Door closer to close the door.
- Lock or latch.

These 3 items are so critical that they must be CE/UKCA marked on any new-build according to the European and UK version of the CPR.

To complete the core essentials:

- Operating furniture (lever or pull handles) to open the door.
- Intumescent seals (sometimes with smoke seal).
- Signage (blue/white fire door sign to suit type of door).

All items must have proven fire performance to be considered for use on a fire door.



Hinge



Door closer



Locking device

## INTUMESCENTS

Intumescent seals are vital to the timber fire door. Hot gases will pour through the small gap between the door and the frame, as heated air around the fire expands and causes a pressure build-up.

These seals are often supplied in a plastic or metal casing, sometimes with an integral smoke seal – wiper blade or brush type. They are fitted to the sides and top of the door or the frame.

When heated by fire they expand to fill the space between the door and frame.



# 4. THE ROLE OF ESCAPE DOORS

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Escape doors are usually on the perimeter of the building, and are the last doors you pass through on the escape route to a place of safety. (Sometimes escape doors are wrongly called fire doors).

## TYPES OF ESCAPE DOORS

There are two types of escape doors:

- Panic escape doors, which have a bar across all or most of the width of the door – BS EN 1125.
- Emergency escape doors, which have a push pad or lever handle – BS EN 179.

Escape doors usually open outwards in the direction of escape. There's no choice with panic bars – you push to open - but some emergency escape doors open inwards.



Emergency escape door



# 5. TYPES OF ESCAPE DOORS

Panic escape bar



## PANIC ESCAPE - BS EN 1125

Panic bars must be used where there are more than 60 people likely to use the exit, or where people are unfamiliar with the building, and so likely to panic in an emergency – e.g. public access areas.

There are many types available, some with one locking point, others with multiple locking points.

### ESSENTIAL QUESTIONS

- **Does the door open easily?** Release should be immediate. You can't struggle with lungs full of smoke.
- **Does the device cover at least 60% of the leaf width?**  
If it is a panic escape door, it must.
- **Does body pressure alone release the door, applied anywhere along its width?**  
The door must yield no matter where the panic bar is pressed.
- **Is the essential hardware CE/UKCA marked?**  
The essential hardware must be CE/UKCA marked according to the European/UK CPR.
- **Is signage present and correct?** There must be a "Push bar to open" sign with directional arrow on inside and a "Fire exit – Keep clear" sign on the outside.
- **Does the other ironmongery function correctly?**  
It must as it may have a negative effect on the essential ironmongery if it doesn't.

## EMERGENCY ESCAPE - BS EN 179

Emergency escape is where employees can be trained in their use during fire drills. This reduces the risk of panic, so there is less likelihood of a crush at the door.

Push pads or lever handles with emergency escape locks are found most often in the workplace. Whichever device is used – lever handle or push pad – the door must open immediately. A single hand operation must withdraw all bolts simultaneously.

### ESSENTIAL QUESTIONS

- **Does the door open easily?** Inward or outward opening is allowed.
- **Check that hinges and any weather seals** are allowing free operation of the door.
- **Is only ONE hand movement needed to release ALL bolts?** (Approved Document B)  
- By turning a lever, (not a knob).  
- Pressing a push pad/pulling a pull pad.
- **Is the essential hardware CE/UKCA marked?**  
The essential hardware must be CE/UKCA marked according to the European/UK CPR.
- **Is signage present and correct?** BS EN 179 requires signage for how to operate the escape device. BS 5499 (BS ISO 7010) requires escape route signs to be same type throughout premises.



Emergency escape push pad

Other devices need very careful risk assessment as they are unlikely to comply with Regulations and product standards.

- **Does the other ironmongery function correctly?**  
It must as it may have a negative effect on the essential ironmongery if it doesn't.

# 5.

## TYPES OF ESCAPE DOORS CONT'D

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### ELECTRICALLY CONTROLLED EXIT SYSTEMS FOR USE ON ESCAPE ROUTES (BS EN 13637)

There is a European Standard which covers electrically controlled exit systems for both panic and emergency escape entitled BS EN 13637:2015.

Specifies requirements for performance and testing of electrically controlled exit systems, specifically designed for use in an emergency or panic situation on escape routes.

This European Standard covers electrically controlled exit systems that are either manufactured and placed on the market in their entirety by one manufacturer or assembled from sub-assemblies produced by more than one manufacturer and subsequently placed on the market as a kit in a single transaction.

It does allow the use of product combined with the mechanical panic or emergency escape standards.

The Standard provides clarity and testing methodology on solutions for electrically operated systems.

An Electrically Controlled Exit System may be combined with mechanical exit hardware – provided they have been tested to BS EN1125 or BS EN179.

Exceptional cases allow inward opening doors such as hospitals, classrooms where local building regulations allow by way of exceptions.





# 6. TYPES OF ESCAPE DOOR HARDWARE

## ESSENTIAL HARDWARE

Certain items of ironmongery (door hardware) are essential to a fire door's performance. They vary from door type to door type, but can include:

- Hinges (or pivots) to hang the door.
- Panic bar to BS EN 1125 for panic escape or push pad / Escape lock with lever handles to BS EN 179 for emergency escape.

These items are so critical that they must be CE/UKCA marked on any new-build.

To complete the core essentials:

- Signage.
- Green running man above or beside the door (NOT on the door).
- Signage explaining use of the escape device e.g. "Push bar to open" with directional arrow.
- Blue/white sign on the outside of the door "Fire Exit - Keep Clear".



Hinge



Panic bar OR push pad/escape lock



Signage



# 7.

## FIRE DOOR INSPECTION

### INSPECTIONS

Fire doors are an essential part of a building's passive fire protection, ensuring that the building is compartmentalised, helping to prevent the spread of fire whilst allowing occupants time to escape. It is therefore imperative that the condition of the fire doors is included as part of the fire risk assessment.

However, a fire door is not just the door leaf. It is a complete assembly of the door, frame, glazing, intumescent, smoke seals and ironmongery. How well all elements work in conjunction together will determine the effectiveness of the door in the event of fire. This can make the process of inspecting a fire door assembly complex and requires a proficient understanding of the relevant building regulations, British Standards and European Standards.

In a recent survey by the Fire Door Inspection Scheme (FDIS), 61% of doors inspected had intumescent or smoke seals either missing or faulty, whilst 34% had excessive gaps between the door and the frame. (BS 8214 Standard states that a typical gap to achieve good fire performance is between 2 mm and 4 mm). Both faults could prove fatal in the event of fire.

Building owners that fail to comply with the regulations can be prosecuted and fined or even serve a prison sentence. Recent prosecutions have been severe, even for seemingly trivial issues such as failing to fit fire seals and door closers or leaving fire doors wedged open.

### FIRE SAFETY (ENGLAND) REGULATIONS: FLAT ENTRANCE DOORS SPECIFICATIONS

Under Regulation 10 owners must:

- Undertake quarterly checks of all fire doors (including self-closing devices) in the common areas
- Carry out – on a best endeavour basis – annual checks of all flat entrance doors (including self-closing devices) that lead onto a building's common areas.

To assist with this GAI have produced a 10-point door closer safety checklist. This assists users to check the device itself as well as the operation of the door and how it is impacted

This can be downloaded from [www.gai.org.uk/user](http://www.gai.org.uk/user).



### BENEFITS

There are many benefits for a building operator or owner to have their fire doors inspected regularly:

- It provides confirmation that fire doors are compliant and will perform as designed in a fire situation.
- Non compliances are detailed by the Competent Person as referenced in the Regulatory Reform (Fire Safety) Order.
- Inspections can therefore be in-line with a building's fire risk assessment or fire strategy.
- It helps to prolong the service life of fire doors.
- Remedial work should be detailed so that any necessary repairs can be clearly identified.
- A working document should be produced to enable exact costing and so avoid unnecessary works and expense.
- It provides help with implementing a suitable maintenance regime.

To ensure peace of mind that your fire doors have been assessed competently, it is advisable to seek the advice of a qualified professional. For further information of finding accredited Fire Door Inspectors, please visit the FDIS website ([www.fdis.co.uk](http://www.fdis.co.uk)).



# 8. MAINTENANCE OF IRONMONGERY

*Hinge maintenance*



## REGULATORY REFORM ORDER

Commonly referred to as the RRO, the Regulatory Reform (Fire Safety) Order came into force in England & Wales on 1st October 2006. It applies to virtually all premises (other than people's private homes) and covers every type of building, structure and open space.

**Compliance with the RRO is mandatory.**

Under the RRO critical items should be maintained at regular intervals as mentioned below:

"Where necessary in order to safeguard the safety of relevant persons the responsible person must ensure that the premises and any facilities, equipment and devices... are subject to a suitable system of maintenance and are maintained in an efficient state, in efficient working order and in good repair."

## MAINTENANCE

Here are some tips on maintaining some of the essential items of ironmongery.

### Hinges

- Tighten and replace any missing fixings.
- Check for wear at knuckles.
- Check for rising pins.
- If door has dropped, replace all 3 hinges with better quality.
- Consider self-lubricating, long-life bearings.
- Hinges on fire and escape doors must be CE/UKCA marked to BS EN 1935.

### Door closers

- Closers on fire and escape doors must be CE/UKCA marked to BS EN 1154.
- The door must fully close from any angle.
- No mechanical hold open devices.
- Controls concealed or tool operable only.
- Delayed action not to exceed 25 seconds.
- Are there any leaks?



*Door closer maintenance*

### Locks

- Check that any latches close easily.
- Check that bolts align with their slots in the strike plate or box keep.
- Check angle of strike plate is correct.
- Locks on fire doors must be CE/UKCA marked to BS EN 12209.
- Intumescent material must be the same type, quantity and thickness as fire test.



The Guild of Architectural Ironmongers (GAI) is the only trade body in the UK that represents the interests of the whole architectural ironmongery industry - architectural ironmongers, wholesalers and manufacturers.

Formed in 1961, the GAI is internationally recognised and respected as the authority on architectural hardware, building its reputation on three key pillars; education, technical support and community.

Its technical information service is the only specialist service of its kind, providing comprehensive advice on issues relating to the legislation, regulations and standards governing the use of architectural ironmongery and related hardware.