

## Importance of fire and smoke doors

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Fire doors perform an important function and are an essential part of a building's fire separations. Any alteration other than maintenance to a building's active or passive fire protection systems, including any doorset, requires a building consent. This article discusses their function and construction in some detail.

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However, the importance of passive fire protection systems should not be ignored. In a building, passive features are vitally important and in many cases could be the silent and unsung hero protecting people and our built environment.

## Passive fire protection

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## Building Code requirements for fire doors

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Clause C3 Spread of Fire of the Building Code requires fire separations. These fire separations must perform as required in order for the building to provide adequate passive fire resistance, thereby allowing the building to function safely in a fire emergency. The fire resistance must be complete across the fire or smoke separation. All components that form part of that separation must be capable of achieving the required fire or smoke (or both) resistance required for the doorset within the separation. Therefore, any door or window installed in the separation must have an appropriate resistance to fire, smoke or both. Any breaches through the separation (including through the doors) must be fire or smoke-stopped (or both) to retain the required rating of the separation.

## About fire and smoke doors

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Fire and smoke doors form part of the separation of buildings into firecells. Most of the time they act just the same as any other door. However, when a fire occurs they perform a vital and specific task by burning at a specific rate and providing a barrier to hold back the fire from other areas. A fire and smoke door must be carefully designed, engineered and tested to an appropriate standard to ensure that, when required, it performs as expected.

A fire door is an entire system of components that interact together to perform as a total unit. It is not just a door leaf in a hole with assorted bits of door furniture and glass added to it. The component parts include frames into which the door leaf fits, the door leaf, glass, intumescent seals, hinges, handles and other ironmongery.

Fire doors are tested as entire units, or assessed as entire units for the purposes of identifying their fire-resisting performance in relation to the appropriate fire test, as required. People who are not intimately familiar with fire door complexities may not recognise when the wrong components have been fitted to a doorset (for example, wrong hinges or missing/incorrect seals). Due to this, they may incorrectly assume that the door will operate in an expected way and provide the required level of safety.

## Methods of fire and smoke door supply and construction

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The following describes the possible methods of supply and construction along with their respective levels of risk.

### a) Complete doorsets

The doorset, including the frame and hardware, is already made up by the manufacturer and supplied to site in that form. This is the optimal way of ensuring compatibility between components. This minimises the risk of unexpected behaviour when the doorset is installed in the building.

### b) Assemblies

This is a doorset made by a third party (not the door manufacturer) from a range of component parts. The door leaf is purchased from the door manufacturer and the correct component parts are sourced from a range of suppliers. The doorset is then constructed. Although the door is fitted with appropriate components, the installation instructions from the doorset manufacturer may not be adhered to. This may result in a higher risk of door failure in the event of a fire.

### c) Door leaves

The door leaves are supplied by the door manufacturer and then component parts are fitted to the leaves as required. This can be done on site. There is a higher risk that the component parts fitted may be inappropriate for their intended use. This method provides the highest risk of door failure in the event of a fire. Door systems are manufactured with specialist knowledge. When a door system undergoes a fire test, the hardware fitted to that doorset is also tested (as part of the door assembly). It is wrong to assume that substituting different components will not affect the performance of the fire door.

## Installation of doorsets

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The fire and smoke door must be correctly fitted into the opening in the fire separation. This includes ensuring:

- the door leaf has the correct rating
- the hinges and other hardware are correct for the particular door leaf
- the frame is of the correct size and material and is installed correctly
- the gaps between the frame and wall are correctly filled
- the correct intumescent seals are used
- any vision panel is correctly formed and glazed
- the correct closer is fitted. Information on the doors is generally available from the door manufacturer and they should provide full instructions with every door leaf supplied.

## Maintaining fire and smoke doors

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Maintaining fire and smoke doors, and indeed all passive protection in buildings, is paramount during the life of the building to ensure the passive protection built into it remains effective for its entire life.

Information on the location and details of the passive fire protection, and the level of fire protection provided, must be included on the building plans and specifications approved for the building consent. Any alteration other than maintenance or repair to the passive fire protection,

including any doorset, requires a building consent. This needs to be obtained before the work occurs. This is important as alterations to, or penetrations through, passive fire protection features must be adequately firestopped to ensure that after the work has been completed the passive protection is returned to its design requirement.

Whether fire separations, including their fire or smoke doors, are included on the building's compliance schedule depends on whether other specified systems are present, as listed in the Building (Specified Systems, Change the Use, and Earthquake-prone Buildings) Regulations 2005.

This matter will be determined as part of the normal building consent process. If the fire separations are on the compliance schedule, there is a legal duty placed on the owner to ensure the compliance schedule requirements are fulfilled.

## Responsibility

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The requirements of the Building Act 2004 and the Building Code need to be met so that the safety of building users is assured. Everyone involved in a building from the designer through to the building consent authority and the end user has a responsibility.

- Designers need to design correctly, by correctly selecting passive fire and smoke protection.
- Plans and specifications detailing the passive fire protection, including the fire and smoke doors, along with the maintenance and compliance schedule requirements need to be submitted and approved as part of the normal building consent process.
- Builders and installers must follow the approved plans and specifications, which will generally entail following the instructions given by the door manufacturer. They also need to ensure all other passive fire protection is installed correctly.
- The building consent authority needs to ensure that the fire doors are supplied and fitted in accordance with the building consent.
- At the final inspection the building consent authority needs to take note of the passive fire protection and ensure it, along with all fire-stopping, is constructed correctly in accordance with the building consent.
- Owners need to ensure the maintenance and compliance schedule requirements, if any, are carried out to retain the passive fire protection at the level required for the building to perform as expected in the event of a fire.
- Occupants need to take care not to damage or remove any passive fire protection during the life of the building.
- Any alteration to the passive fire protection in a building must be done under a building consent.

All guidance related to C1 Objectives of Clauses C2 to C6(<https://www.building.govt.nz/building-code-compliance/c-protection-from-fire/c-clauses-c1-c6/>)

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