

BS 8414 Fire performance of external cladding systems

The British Standards Institution (BSI) is the UK National Standards Body (NSB). It publishes standards and provides a range of books, self-assessment tools, conferences and training services. It also represents UK economic and social interests in European and international standards organisations. British Standard (BS) publications are technical specifications or practices that can be used as guidance for the production of a product, carrying out a process or providing a service.

BS 8414 is a two-part standard:

- BS 8414-1:2015 Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems applied to the masonry face of a building was published in 2015. It was then amended by BS 8414-1:2015+A1:2017 in June 2017. It can be used to test rainscreen cladding and external wall insulation systems.
- BS 8414-2:2015 Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel framework published in 2015. It was then amended by BS 8414-2:2015+A1:2017 in June 2017.

The use of new and innovative products for cladding buildings has given rise to concerns about fire performance, as these systems are often less well understood than more traditional construction materials. A number of high profile fires have illustrated the importance of adequately testing external wall systems on a realistic scale.

First published as British Standards in 2002, the BS 8414 test methods were developed by the Building Research Establishment (BRE). They evaluate whether a cladding system subject to firebreacking out of an opening (such as a window) in an external wall, will result in excessive firespread up the outside of the building and the potential for fire to re-enter at a higher level.

The tests are carried out in specialist laboratories, and are performed on full-scale systems (rather than small-scale samples) incorporating joints and corner details, fixings, insulation, firebreaks, cavities and other elements of the system construction.

BS 9991:2015 Fire safety in the design, management and use of residential buildings. Code of practice

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BS 9991:2015 Fire safety in the design, management and use of residential buildings. Code of practice, complements BS 9999: Code of practice for fire safety in the design, management and use of buildings (for buildings that are not residential).

BS 9991 is intended to help people put suitable fire safety measures in place in residential buildings, such as; fire detection and alarm systems, fixed fire-fighting systems and so on. It gives recommendations and guidance on the design, management and use of residential buildings so they achieve reasonable standards of fire safety for people who are in and around them and fire-fighters. It provides guidance on the management of fire safety during the whole lifecycle of a building. It applies to the design of new buildings, and to material alterations, extensions and material changes of use to existing buildings.

BS 9999: Code of practice for fire safety in the design, management and use of buildings

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BS 9999: Code of practice for fire safety in the design, management and use of buildings, provides a best practice framework for fire safety. It is aimed at designers and architects

It is intended for:

- Architects, surveyors and designers.
- Facilities and building managers and building control officers.
- Fire and rescue services, fire risk consultants and fire safety engineers.
- Access consultants.

It complements BS 9991:2015 Fire safety in the design, management and use of residential buildings. Code of practice.

It was published in 2008, when it part-superseded BS 5588 Fire precautions in the design, construction and use of buildings, parts of which are still relevant to residential buildings. It also replaced DD 9999 Code of practice for fire safety in the design, construction and use of buildings. It provides recommendations and guidance on the design, management and use of buildings to achieve acceptable levels of fire safety for people in and around buildings.

It details ways in which fire safety legislation can be complied with through a more flexible design approach. Approved Document B (Fire Safety) provides guidance about how the building regulations can be satisfied in common building situations, but these are not always applicable to more complex, larger building. BS 9999 takes a more holistic view of fire safety, allowing for compensatory measures to offset, for example, travel distances or escape door widths.

The standard provides a risk-based structure that takes into account varying human factors, and reflects the requirements of the Disability Discrimination Act with regard to inclusive design principles.

New buildings, extensions, existing buildings and buildings at design stage can all be considered in relation to BS 9999. In addition, fire safety strategies can be kept robust and effective by the use of an assessment tool which outlines methods of testing items such as easy access to exits, safety of people in and around the building, and so on. The standard covers the maintaining of a fire detection system as well as guidance on the fire safety training of employees, organising efficient evacuation plans, and allocating leadership responsibilities.

BS 9999 was revised in 2017 to align the standard with current good practice, new technology, and consistency with other fire recently revised safety standards, namely BS 9990 and BS 9991.

The main changes in BS 9999 over the standard it replaces are:

- An inclusion of a flowchart showing the sequential steps in the design process, to assist users in the application of the standard.

- Revised clause on fire safety management with references to PAS 7.
- Inclusion of watermist fire suppression systems.
- Expansion of the guidance on voice alarms.
- Expansion of fire growth rates table to provide more information.

The revised standard also features updated recommendations for smoke and heat control; firecurtain barrier assemblies; mechanical ventilation and air-conditioning systems; shopping complexes; and ducting.

Fire performance of external thermal insulation for walls of multistorey buildings, third edition (BR 135)

BRE (Building Research Establishment) is an independent, research-based consultancy, testing and training organisation, operating in the built environment and associated industries.

In 2013, BRE published Fire performance of external thermal insulation for walls of multistorey buildings: Third edition (BR 135), written by Sarah Colwell and Tony Baker.

External cladding systems offer a potential route for the spread of fire through multistorey buildings. BR 135 sets out principles, design methodologies and fire spread performance characteristics for non-loadbearing cladding systems.

The first edition was published in 1988 in response to the increasing use of thermal insulation in the refurbishment of multistorey buildings. This third edition and has been revised to reflect the growing market for external cladding systems and the increasingly demanding requirements for thermal performance requirements. It also provides updated guidance on the performance of current materials and technologies.

It describes and illustrates scenarios based on typical examples of current practice, allowing designers to understand the parameters relating to fire safety design and the construction of external cladding. It also consolidates the fire performance classification systems for full-scale firetests in BS 8414 Fire performance of external cladding systems.

The contents of BR 135 are:

- Executive summary.
- Introduction.
- Legislation.
- Mechanisms of fire spread.
- Cladding systems: Application and types.
- External finish construction types.
- Fire performance design principles for external cladding systems.
- Annex A: Performance criteria and classification method of BS 8414-1.
- Annex B: Performance criteria and classification for BS 8414-2.

BR 135 became the centre of attention in June 2017, when ACM cladding was the focus of investigations into the speed at which fire spread in the Grenfell Tower fire. See ACM cladding form more information.

The Regulatory Reform (Fire Safety) Order 2005

The Regulatory Reform (Fire Safety) Order 2005 (sometimes referred to as the Fire Safety Order (FSO) or the RRO) came into force in 2006.

It was intended to "...reduce burdens on business that are caused by the existence of multiple, overlapping general fire safety regimes – and consequently overlap of the responsibilities of enforcing authorities.... consolidate and rationalise much existing fire safety legislation (and) reduce the number of enforcing authorities dealing with general fire safety matters."

It replaces most previous fire safety legislation.

The Order requires that owners of premises other than private dwellings appoint a responsible person (the person having control of the building, or a degree of control) who takes reasonable steps to reduce the risk from fire and makes sure people can safely escape if there is a fire. This includes all people that might visit the premises.

This duty involves carrying out a fire risk assessment, or ensuring one is carried out. This will include:

- Identifying fire hazards.
- Considering who may be at risk.
- Eliminating or reducing risk where reasonably possible.
- Providing fire precautions to deal with remaining risk.
- Taking special precautions where there are flammable or explosive materials.
- Recording major findings of the risk assessment and the action taken. This will include informing and instructing relevant people, providing training and creating an emergency plan.
- Reviewing the findings regularly and when necessary.

Fire authorities no longer issue fire certificates. However, they remain the main agency responsible for enforcement, carrying out inspections, assessing complaints and undertaking investigations. They have the power to offer advice, issue formal notices, and prevent premises from being used for certain purposes. They may issue alterations notices for high risk premises, requiring that they are informed if certain alterations are planned to the premises.

A review of the Order published by the Department for Business Innovation & Skills in 2013, *Enforcement of the Regulatory Reform (Fire Safety) Order 2005*, found that the need for the Order was generally understood, however:

- There is considerable discretion as to how each fire authority approaches its duties, leading to frustrating inconsistencies.
- There is a strong sense that fire protection departments are given less prominence than operational fire-fighters or community safety teams.
- Many small businesses are not aware of their specific responsibilities under the changes made to the legislation.