

BRITISH STANDARD

Code of practice for fire door assemblies

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Foreword

Publishing information

This British Standard is published by BSI and came into effect on 30 September 2008. It was prepared by Subcommittee B/538/2, *Doors*, under the authority of Technical Committee B/538, *Doors, windows, shutters, hardware and curtain walling*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 8214:1990, which is withdrawn.

Information about this document

This is a full revision of the standard, and introduces the following principal changes.

- The details regarding the manufacturing of a fire door have been removed.
- The guidance now concentrates on the selection of fire door sets, door assemblies and door leaves.
- The guidance is now applicable to fire doors of all materials.
- Guidance on site handling has been retained and expanded.

In recent years there has been an increase in performance-based regulations and codes and a corresponding decrease in the use of specified constructions for particular functional applications. Fire doors are now specified by the level of performance that they can attain when subjected to the standard method of test for the determination of the fire resistance of elements of construction. There are currently two methods of test, given in BS 476-22 and BS EN 1634-1 respectively. Whilst most of the advice given in this British Standard is based on testing performed in accordance with BS 476-22, it is expected that the guidance will be applicable to tests performed in accordance with BS EN 1634-1, and some changes in the advice are designed to reflect the differences between the methods.

Fire doors perform a vital function in the provision of an adequate means of escape from a building and, depending upon the intended use of the building, the appropriate part of BS 5588¹⁾ and other guidance documents recommend both the performance rating and the position of the fire doors required to ensure safe egress. Similarly, guidance in support of national building regulations includes provision for the control of the spread of internal fire, by means of compartmentation or other techniques, and again adequately rated fire doors contribute to this containment. The rating of such doors will be specified by the design team/designer, possibly in conjunction with fire safety professionals, using the recommendations given in these national guidance documents, or by the fire strategy that has been developed to meet the functional objectives. The fire resistance provisions of the structure, including the fire door assemblies, will have been generated, when designing to meet the functional requirements of the regulations, as that which is necessary to control the hazard from fire to acceptable levels of risk.

Subsequent to the acceptance by the regulatory controllers of the fire protection measures provided, the Regulatory Reform (Fire Safety) Order 2005 [1] requires all buildings to be subjected to ongoing fire risk assessment and the risk assessors will either endorse the measures provided or specify their own requirements.

This British Standard identifies the important parameters in the design, construction and use of fire doors that contribute to the successful attainment and maintenance of the level of performance deemed appropriate to contain the risk.

The information is of value to the specifier of such doors, including the risk assessor, as it identifies the key parameters to be specified and advises on any constraints that might apply to the design to be specified. Controlling authorities will find that the information will assist them in evaluating whether the evidence of performance submitted is relevant to the component under examination, and whether further evidence of performance is required.

Assistance is provided to the construction team by identifying the permissible site operations and by the provision of guidance relating to the installation of such assemblies. Finally, advice on how to maintain fire doors in an operating condition is provided for use by property management.

Use of this document

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

¹⁾ A Draft for Development, DD 9999, was published in 2005 and is expected to supersede a majority of the BS 5588 series when it is published as a full British Standard.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

0 Introduction

0.1 Role and use of fire doors

Fire doors are required to provide two main functions:

- a) to maintain any compartmentation of buildings, which has been introduced to limit the size and spread of fire in order to control the perceived risk;
- b) to allow access to protected escape routes, both vertically and horizontally, without any loss of fire resistance, and limit smoke movement in the structure forming these routes, i.e. protected corridors and protected shafts.

Recommended positions and ratings for fire doors for means of escape purposes are given in the BS 5588 series and in BS 7974. The recommendations in the BS 5588 series use a risk-based approach; those in BS 7974 are based on the principles of fire safety engineering.

NOTE A Draft for Development, DD 9999, was published in 2005 and is expected to supersede a majority of the BS 5588 series when it is published as a full British Standard. Recommended positions and ratings for fire doors are given in DD 9999:2005, Table 27.

0.2 Fire door rating

The method of expressing the results of fire resistance tests, both at international and national levels, only utilizes the criteria of integrity (E) and insulation (I). The performance of a fire door when tested in accordance with BS 476-22 or BS EN 1634-1 is judged by its time to failure (in minutes) for both integrity and insulation (see Clause 4); however, for the purposes of regulatory guidance, fire doors are designated by reference to their required performance for integrity. Such doors are identified by the prefix FD followed by the required integrity rating expressed in minutes, e.g. FD30, a fire-resisting door able to resist integrity failure for 30 min. The following ratings fall within the scope of this British Standard: FD20, FD30, FD45, FD60, FD90 and FD120.

NOTE 1 National building regulations [2]–[4] only apply to life safety. Higher performance levels (such as insulation) might be necessary for certain applications if property protection is required.

In a fire safety strategy it might be an additional requirement for a door to meet the criteria of insulation (I) and/or radiation (W) for a specified period of time.

NOTE 2 Insulation (I) and radiation (W) performances are totally different. Ratings for glasses should only be compared on the basis of fire test results.

In addition to the need to provide fire resistance, certain doors are also required, by legislation, to restrict the spread of ambient temperature (“cold”) smoke. These doors are identified by the suffix S, e.g. FD30S, and, when tested in accordance with BS EN 1634-3 or BS 476-31.1, are required to conform to BS EN 13501-2 or to the relevant part of BS 5588, respectively.

NOTE 3 See the Note to 0.1 regarding the BS 5588 series.

1 Scope

This British Standard gives recommendations for the specification, installation and maintenance of fire doors. The recommendations are applicable only to hinged or pivoted pedestrian doorsets, door assemblies, or door leaves of any material, fitted into frames of any material.

This British Standard is applicable only to doors that are designed to provide fire resistance ratings of up to and including 2 h when tested in accordance with BS 476-22 or BS EN 1634-1.

This British Standard is applicable only to the fire performance of the doors and doorsets. It does not cover security, ergonomic factors, functional performance other than with respect to fire resistance, or safety of glazing.

2 Normative references

BS 476-22, *Fire tests on building materials and structures – Part 22: Methods for determination of the fire resistance of non-loadbearing elements of construction*

BS 476-31.1, *Fire tests on building materials and structures – Part 31: Methods for measuring smoke penetration through doorsets and shutter assemblies – Section 31.1: Method of measurement under ambient temperature conditions*

BS EN 179, *Building hardware – Emergency exit devices operated by a lever handle or push pad – Requirements and test methods*

BS EN 1125, *Building hardware – Panic exit devices operated by a horizontal bar – Requirements and test methods*

BS EN 1634-1, *Fire resistance tests for door and shutter assemblies – Part 1: Fire doors and shutters*

BS EN 12209, *Building hardware – Locks and latches – Mechanically operated locks, latches and locking plates – Requirements and test methods*

3 Terms and definitions

For the purposes of this British Standard, the following terms and definitions apply.

3.1 building hardware

3.1.1 essential building hardware

items vital to achieve the fire-resisting performance of a fire door assembly when incorporated into a building

NOTE Guidance on essential building hardware is given in Annex A.

3.1.2 building hardware

small components, usually metal, used mainly for the operation or support of doors

3.1.3 non-essential building hardware

items that are not required to achieve the fire resistance performance of a fire door assembly, but which if fitted might affect the performance

NOTE Guidance on non-essential building hardware is given in Annex A.

3.2 door

building component for closing an opening in a wall that allows access and might or might not admit light when closed

NOTE The word “door” is used as a generic term for door leaves, door frames, doorsets, door assemblies and door kits.

3.3 door assembly

complete assembly as installed, including door frame and one or more leaves, together with its essential building hardware supplied from separate sources

3.4 door frame

fixed surround into which are fitted one or more door leaves

NOTE The door frame can also be designed to surround other panels, and can include sill, threshold, architraves or other cover moulds. The door frame can be a separate item to be fixed to the adjacent structure, or it can be an integral part of a wall or partition.

3.5 door kit

set of fully machined and fitted frame components together with a door leaf or leaves fully prepared for site assembly and fixing

NOTE Door kits might or might not include all the items of building hardware required for the finished door assembly.

3.6 door leaf

hinged or pivoted construction intended to allow or prevent access

3.7 doorset

door frame with its door leaf or leaves pre-hung on hinges or pivots, supplied as an assembled unit from a single source

NOTE Due to size or weight, some doorsets might need to be delivered in separate parts, although pre-hung and pre-assembled in the factory.

3.8 fire door

door provided for the passage of persons, air or objects which, together with its frame and furniture as installed in a building, is intended (when closed) to restrict the passage of fire and/or gaseous products of combustion, and is capable of meeting specified performance criteria to those ends

NOTE A fire door may have one or more leaves, and the term includes a cover or other form of protection to an opening in a fire-resisting wall or floor or in a structure surrounding a protected shaft.

3.9 fire door assembly

door assembly, intended, when closed, to restrict the passage of fire and/or gaseous products of combustion and to be capable of meeting specified performance criteria to those ends