

Fire resistance tests for loadbearing elements —

Part 1: Walls

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British Standard

ICS 13.220.50

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National foreword

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The UK participation in its preparation was entrusted by Technical Committee FSH/22, Fire resistance tests, to Subcommittee FSH/22/7, Test procedures for partitions and walls, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 24, an inside back cover and a back cover.

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This British Standard, having been prepared under the direction of the Health and Environment Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 November 1999

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ISBN 0 580 32423 0

Amendments issued since publication

Amd. No.	Date	Comments

English version

Fire resistance tests for loadbearing elements – Part 1: Walls

Essais de résistance au feu des éléments porteurs –
Partie 1: MursFeuerwiderstandsprüfungen für tragende Bauteile – Teil 1:
Wände

This European Standard was approved by CEN on 18 February 1999.

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 127 "Fire safety in buildings", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2001, and conflicting national standards shall be withdrawn at the latest by March 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the Construction Products Directive.

EN 1365 'Fire resistance tests for loadbearing elements' consists of the following

Part 1: Walls

Part 2: Floors and roofs

Part 3: Beams

Part 4: Columns

Part 5: Balconies (in course of preparation)

Part 6: Stairs and walkways (in course of preparation)

Introduction

The purpose of this test is to measure the ability of a representative specimen of a loadbearing wall to resist the spread of fire from one side to another and to maintain its loadbearing capacity. It is applicable to internal and external walls.

Caution

The attention of all persons concerned with managing and carrying out this fire resistance test is drawn to the fact that fire testing may be hazardous and that there is a possibility that toxic and/or harmful smoke and gases may be evolved during the test. Mechanical and operational hazards may also arise during the construction of the test elements or structures, their testing and disposal of test residues.

An assessment of all potential hazards and risks to health shall be made and safety precautions shall be identified and provided. Written safety instructions shall be issued. Appropriate training shall be given to relevant personnel. Laboratory personnel shall ensure that they follow written safety instructions at all times.

1 Scope

This Part of EN 1365 specifies a method of testing the fire resistance of load bearing walls. It is applicable to both internal and external walls. The fire resistance of external walls can be determined under internal or external exposure conditions.

The fire resistance performance of load bearing walls is normally evaluated without perforations such as glazing. If it can be demonstrated that the design of the opening is such that load is not transmitted to the perforation, then the perforation need not be tested in the loaded condition.

If perforations are to be included the effects of these will need to be separately established. The performance of fire resistant glazing is addressed in EN 1364-1.

This test method is not applicable to:

- i) curtain walls (non-loadbearing external walls suspended in front of the floor slab) which are considered specifically in prEN 1364-3.
- ii) walls containing door assemblies which shall be tested to EN 1634-1.
- iii) non-separating load bearing walls which, in short widths, can be tested as columns to EN 1365-4.

This European Standard is used in conjunction with EN 1363-1.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1363-1 Fire resistance tests Part 1 General requirements
EN 1363-2 Fire resistance tests Part 2 Alternative and additional procedures
EN 1364-1 Fire resistance tests for non-loadbearing elements Part 1 Walls
prEN 1364-3 Fire resistance tests for non-loadbearing elements Part 3 Curtain walls - full configuration
EN 1365-4 Fire resistance tests for loadbearing elements Part 4 Columns
EN 1634-1 Fire resistance tests for door and shutter assemblies Part 1 Fire doors and shutters
prEN ISO 13943 Fire safety - Vocabulary (ISO/DIS 13943:1998)

3 Definitions

For the purposes of this Part of EN 1365 the definitions given in EN 1363-1 and prEN ISO 13943, together with the following, apply:

3.1 loadbearing wall: A wall designed to support an applied load.

3.2 internal wall: A wall which provides fire separation. It may be exposed separately to a fire from either side.

3.3 external wall: A wall forming the external envelope of a building which may be exposed separately to an internal or an external fire.

3.4 insulated wall: A wall, with or without glazing, which satisfies both the integrity and insulation criteria for the anticipated fire resistance period.

3.5 uninsulated wall: A wall which satisfies the integrity and, where required, the radiation criteria for the anticipated fire resistance period, but which is not intended to provide insulation. Such a loadbearing wall may consist entirely of uninsulated fire resistant panels.

3.6 standard supporting construction: A form of construction used to close off the furnace and to support the loadbearing wall being evaluated and which has known resistance to thermal distortion.

3.7 plinth: A form of standard supporting construction that reduces the height of the opening by raising the support base to accommodate the test specimen.

3.8 separating wall: A wall provided within a building or between adjoining buildings to prevent the transfer of fire from one side to the other.

4 Test equipment

4.1 General

In addition to the test equipment specified in EN 1363-1, and if applicable EN 1363-2, the following is required:

4.2 Test frame

A test frame designed to accommodate the test specimen and apply the required test load. Examples of test frames which may be used for this purpose are shown in figures 1 and 2.

4.3 Loading equipment

The load to the test specimen may be applied by means of loading jacks located either at the top or the bottom of the frame. Where the loading is applied by a rigid beam it shall be of sufficient stiffness to ensure uniform vertical deflection along the test specimen. Where the load is applied individually to studs within the wall the loading system shall allow for maintenance of constant load at each loading point.

5 Test conditions

5.1 Furnace atmosphere

The heating and pressure conditions and the furnace atmosphere shall conform to those given in EN 1363-1.

5.2 Loading and restraint

The load and restraint shall conform to the requirements given in EN 1363-1.

6 Test specimen

6.1 Size

If, in practice, the height or width of the construction is 3 m or smaller, then that dimension of the test specimen shall be tested at full size. If any dimension of the construction is greater than 3 m, then that dimension shall be tested at not less than 3 m.

6.2 Number

The number of test specimens shall be as given in EN 1363-1. However, where information is required under different exposure conditions additional tests shall be undertaken for each situation using separate test specimens.

6.3 Design

The test specimen shall be either:

- a) fully representative of the construction intended for use in practice, including any surface finishes and fittings which are essential and may influence its behaviour in the test,
- or,
- b) be designed to obtain the widest applicability of the test result to other similar constructions.

The design features which influence fire performance that should be included to give the widest application can be derived from the field of direct application, clause 13.

The test specimen shall not contain mixtures of different types of construction e.g. bricks or blocks in a wall unless this is fully representative of the construction in practice. Where the test specimen can incorporate at least two full width boards, a full size board shall be adjacent to an edge. When it is not possible to incorporate two full size boards into the test specimen, the single full size board shall be located in the centre of the specimen, with smaller boards of equal width on each side. The smaller boards shall not be less than 500 mm wide. Where the smaller boards would be less than 500 mm wide, only one shall be used (see figure 3).

6.4 Construction

The test specimen shall be constructed as described in EN 1363-1.