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Preskusi požarne odpornosti in dimotesnosti vrat, zapor in oken, ki se odpirajo, ter elementov stavbnega okovja - 1. del: Preskus požarne odpornosti za vrata, zapore in okna, ki se odpirajo

Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware - Part 1: Fire resistance tests for doors, shutters and openable windows

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Feuerwiderstandsprüfungen und Rauchschutzprüfungen für Türen, Tore, Abschlüsse, Fenster und Baubeschläge - Teil 1: Feuerwiderstandsprüfungen für Türen, Tore, Abschlüsse und Fenster

Essais de résistance au feu et d'étanchéité aux fumées des portes, fermetures, fenêtres et éléments de quincailleries - Partie 1 : Essais de résistance au feu des portes, fermetures et fenêtres

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91.060.50	Vrata in okna	Doors and windows
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Fire resistance and smoke control tests for door, shutter and
openable window assemblies and elements of building hardware
- Part 1: Fire resistance tests for doors, shutters and openable
windows

Essais de résistance au feu et d'étanchéité aux fumées des
portes, fermetures, fenêtres et éléments de quincailleries -
Partie 1 : Essais de résistance au feu des portes,
fermetures et fenêtres

Feuerwiderstandsprüfungen und Rauchschutzprüfungen für
Türen, Tore, Abschlüsse, Fenster und Baubeschläge - Teil
1: Feuerwiderstandsprüfungen für Türen, Tore, Abschlüsse
und Fenster

This European Standard was approved by CEN on 8 August 2008.

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Foreword

This document (EN 1634-1:2008) 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of an identical text or by endorsement, at the latest by April 2009, and conflicting national standards shall be withdrawn at the latest by April 2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1634-1:2000.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of 89/106/EEC.

EN 1634 ‘*Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware*’ of the following:

- Part 1: *Fire resistance tests for doors, shutters and openable windows*
- Part 2: *Fire resistance characterisation test for elements of building hardware (in course of preparation)*
- Part 3: *Smoke control test for door and shutter assemblies*

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

EN 1634-1:2008 (E)

Introduction

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 will need to be made and safety precautions will need to be identified and provided. Written safety instructions will need to be issued. Appropriate training will need to be given to relevant personnel. Laboratory personnel will need to ensure that they follow written safety instructions at all times.

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1 Scope

This Part of EN 1634 specifies a method for determining the fire resistance of doors, shutters and openable windows designed for installation within openings incorporated in vertical separating elements, such as:

- hinged or pivoted doors;
- horizontally sliding and vertically sliding doors including articulated sliding doors and sectional doors;
- sliding folding doors and shutters;
- tilting doors;
- rolling shutters;
- openable windows;
- openable fabric curtains.

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

Doors tested in accordance with this European Standard and classified in accordance with EN 13501-2 may be accepted for lift landing door applications as an alternative to EN 81-58. EN 81-58 represents a specific test for lift landing doors and results in an alternative classification which may not be suitable for some other purposes as defined in National Regulations.

The testing of fire dampers is covered by EN 1366-2.

The testing of closures for conveyor systems is covered by EN 1366-7.

Further requirements are described in the relevant product standard and in the supporting standard EN 14600.

This method may also be used to determine the fire resistance of non-loadbearing horizontally orientated doors, shutters and openable windows by analogy. However, these are not specifically addressed here and the field of direct application given in Clause 13 is not valid for such horizontally orientated products.

By prior agreement with the test sponsor additional information may be gained for individual elements of building hardware. Based on the observations recorded during the test, the results may be presented in a separate report.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1363-1:1999, *Fire resistance tests — Part 1: General requirements*

EN 1363-2, *Fire resistance tests — Part 2: Alternative and additional procedures*

EN 12519:2004, *Windows and pedestrian doors — Terminology*

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EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN 14600, *Doorsets and openable windows with fire resisting and/or smoke control characteristics — Requirements and classification*

prEN 15269 (all parts), *Extended application of test results for fire resistance and/or smoke control for door, shutter and openable window assemblies, including their elements of building hardware*

EN ISO 13943:2000, *Fire safety — Vocabulary (ISO 13943:2000)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1363-1:1999, EN 12519:2004, EN ISO 13943:2000 and the following apply.

3.1**door or shutter assembly****doorset**

pedestrian doorset or industrial type doorset including any frame or guide, door leaf or leaves, rolling or folding curtain, etc., which is provided to give a fire resisting capability when used for the closing of permanent openings in fire resisting separating elements, which includes any side panel(s), vision panel(s), flush over panel(s) and/or transom panel(s) together with the building hardware and any seals (whether provided for the purpose of fire resistance or smoke control or for other purposes such as draught or acoustics) which form the assembly

3.2**openable (for windows only)**

applying to windows with one or more moveable leaf or leaves including any side or over panel(s), perimeter frame and any elements of building hardware

3.3**building hardware**

items such as hinges, handles, locks, exit devices, escutcheons, letter plates, kick plates, sliding gear, closing devices, electrical components, wiring, etc., which are, or can be, used in the doorset or openable window

3.4**single action**

action of a door leaf of a (single or double leaf) doorset that opens in only one direction

3.5**double action**

action of a door leaf of a (single or double leaf) doorset that opens in two directions

3.6**floor**

upper surface of the horizontal element on which the doorset or openable window is mounted and which extends from the exposed face to the unexposed face of the assembly

3.7**sill**

member which connects two frame jambs together at the base which may or may not be set into the floor and remains visible

3.8**gap**

clearance between two adjacent surfaces and/or edges e.g. between the edge of the leaf and the reveal of the frame or between the face of the leaf and the frame stop

NOTE This does not refer to the integrity failure gap for which the gap gauges are referenced in 10.2.2.

3.9**through component/connection**

internal spacer or fixing that either penetrates through the doorset or openable window from one face to another or directly connects the faces one to the other

3.10**standard supporting construction**

form of construction used to close off the furnace and to support the doorset or openable window being evaluated and which has a quantifiable influence on both the thermal heat transfer between the construction and the test specimen and provides known resistance to thermal distortion

3.11**associated supporting construction**

specific construction in which the doorset or openable window is to be installed in practice and which is used to close off the furnace and provide the levels of restraint and thermal heat transfer to be experienced in normal use

3.12**test specimen**

doorset or openable window which is to be installed in a standard or associated supporting construction to allow it to be evaluated

3.13**transom**

member that extends across the frame from jamb to jamb at the head of the leaf and which creates an aperture to house a transom panel

3.14**transom panel**

panel which is incorporated within a doorset or openable window and fitted above the leaf or leaves and is bounded on all edges by the frame head, the jambs and the transom

3.15**flush over panel**

panel which is incorporated within a doorset or openable window and fitted above the leaf or leaves within the frame head and the jambs and with no transom

3.16**side panel**

panel which is incorporated within a doorset or openable window and fitted at one side of a leaf and is bounded on all edges by the perimeter frame, the jambs and the transom (when applicable)

EN 1634-1:2008 (E)**4 Test equipment**

The test equipment specified in EN 1363-1, and if applicable EN 1363-2, shall be used.

5 Test conditions

Appropriate mechanical pre-test conditioning shall be completed in accordance with the requirements in EN 14600.

The heating and pressure conditions and the furnace atmosphere shall conform to those given in EN 1363-1 or, if applicable, EN 1363-2 except for openable windows where the pressure at the top of the test specimen shall be 20 Pa.

6 Test specimen**6.1 General**

Guidance on the selection of test specimen(s) is given in EN 14600 and the prEN 15269 series of extended application standards.

The figures included with this standard show test specimen(s) of different types of doorsets. The figures may also be used by analogy for openable windows.

6.2 Size

The test specimen and all its components shall be full size unless limited by the size of the front opening of the furnace which will normally be 3,0 m × 3,0 m. Doorsets and openable windows which cannot be tested at full size shall normally be tested to the maximum size possible consistent with 7.2.3.

6.3 Number

The number of test specimens required to determine the fire resistance of a doorset or an openable window shall be selected in accordance with EN 1363-1 unless alternative provisions are permitted by 13.4.

6.4 Design

The design of the test specimen and the choice of supporting construction shall take into account the requirements of 13 if the widest field of direct application is to be achieved.

The sponsor shall declare to the laboratory the design values for the gaps (see 3.8) including tolerances.

Where the doorset and openable window incorporates side, transom or flush over panels, whether glazed or unglazed, these shall be tested as part of the assembly. If only one side panel is incorporated, this shall always be installed on the latch side of the doorset and openable window.

The test specimen shall be fully representative of the doorset and openable window intended for use in practice, including any appropriate surface finishes, elements of building hardware and fittings as these are an essential part of the test specimen and may influence its behaviour in the test.

6.5 Construction

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

6.6 Verification

The sponsor shall provide a specification to a level of detail sufficient to allow the laboratory to conduct a detailed examination of the test specimen before the test and to agree the accuracy of the information supplied (e.g. a parts list and drawings giving materials, dimensions and mounting and fixing methods, including those for items of building hardware). EN 1363-1 provides detailed guidance on verification of the test specimen.

When the method of construction precludes a detailed survey of the test specimen, without having to permanently damage it or if it is considered that it will subsequently be impossible to evaluate construction details from a post test examination, then one of two options shall be exercised by the laboratory, either:

- a) the laboratory shall request to oversee the manufacture of the doorset or openable window which is to be the subject of the test; or
- b) the sponsor shall, at the discretion of the laboratory, be requested to supply an additional test specimen or that part of the test specimen which cannot be verified (e.g. a door leaf) to the number required for testing; the laboratory shall then choose freely which of these shall be submitted to the test and which shall be used to verify the construction.

6.7 Building hardware

Any item of building hardware shall be measured, analysed and described in detail before the test commences. Where it is not possible to confirm the manufacturer's description it shall be clearly stated that the manufacturer's declaration has been used.

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7 Installation of test specimen

7.1 General

The test specimen shall be installed, as far as possible, in a manner representative of its use in practice; e.g. for some sliding doors, the sliding track may be cut in length to accommodate the doorset within the furnace aperture.

The test specimen shall be mounted in a supporting construction which covers the type in which it is intended to be used. The design of the connection between the doorset or openable window and the supporting construction, including any fixings and materials used to make the junction, shall be as used in practice and shall be regarded as part of the test specimen. The test specimen shall be mounted within the supporting construction so that it is flush with the exposed face of the supporting construction, unless a different position is used in practice

The whole area of the test specimen, together with at least the minimum dimensions of the supporting construction, shall be exposed to the heating conditions.

7.2 Supporting construction

7.2.1 General

The fire resistance of any supporting construction shall not be determined from a test in conjunction with a doorset or openable window and shall be at least commensurate with that anticipated for the product.

EN 1634-1:2008 (E)**7.2.2 Standard supporting construction**

The choice of standard supporting construction shall reflect the intended normal use of the doorset or openable window. The rules governing the applicability of the chosen standard supporting construction to other end use situations are given in 13.5.

The standard supporting construction shall be chosen from those given in EN 1363-1.

7.2.3 Erection of standard supporting and associated supporting constructions

Figures D.1 to D.8 illustrate the use of supporting constructions in conjunction with the mounting of test specimens of different types of doorsets.

For flexible standard supporting constructions and all associated supporting constructions the partition or wall shall be erected so that it can distort freely perpendicular to the plane of the supporting construction along the vertical edges; i.e. there shall be a free edge at each vertical end of the test construction.

For rigid standard supporting constructions the wall shall be erected with no freedom to distort perpendicular to the plane of the wall along the vertical edges; i.e. it shall be fixed to the inside of the test frame as in practice.

The supporting construction shall be built within a test frame conforming to EN 1363-1. The supporting construction shall be prepared in advance of the mounting of the test specimen leaving an aperture of the desired size, except when it is normally erected in conjunction with the doorset or openable window using appropriate fixing methods.

There shall be a minimum zone of supporting construction of 200 mm wide within the furnace opening, each side and over the top of the aperture into which the test specimen is to be fixed. The thickness of the supporting construction may be increased outside of the 200 mm zone.

The test construction may incorporate more than one test specimen providing that there is a minimum width of 200 mm supporting construction to separate test specimens within a rigid supporting construction but a minimum width of 300 mm supporting construction to separate test specimens within a flexible or an associated supporting construction and a minimum separation of 200 mm between each test specimen and the edges of the test frame.

If the bottom of the doorset or openable window is at floor level in practice, then at the bottom of the aperture continuity of the floor shall be simulated using a floor extension of a solid non-combustible material which has a minimum dimension of 200 mm from the leaf or leaves on each side of the test specimen (i.e. from the exposed and the unexposed face) and which has a density of at least 450 kg/m³. The furnace floor can be regarded as part of the simulation of the floor continuity provided that it is level with the base of the test specimen. If a sill detail is incorporated as part of the doorset or openable window this shall be incorporated within or placed on top of the floor extension. If the doorset or openable window is not to be used at floor level, and provided that it has a frame detail to all four sides of the aperture, then it may be mounted simply within the thickness of the wall, without a floor extension.

NOTE When a doorset or openable window is tested in conjunction with a non-combustible floor covering then, in certain circumstances, this will not represent the situation when the doorset or openable window is installed in conjunction with a combustible floor covering, e.g. timber or textile.

7.3 Gaps

The adjustment of the gaps shall be within the tolerances of the design values stipulated by the sponsor. These shall be representative of those used in practice so that appropriate clearances exist, e.g. between the fixed and moveable components; however in all cases the maximum through gap shall not exceed 25 mm at the sill or 6 mm by 150 mm in other areas as these gaps would constitute an integrity failure (gap gauge method).

In order to generate the widest field of direct application (category B from 13.3.2), the 'primary' gaps i.e. gaps perpendicular to the face of the leaf for hinged or pivoted doorsets or openable windows or tightness for sliding folding or rolling doorsets or openable windows (as shown in Figure D.33), shall be set in between the middle value and the maximum value within the range of gaps for each part of the doorset or openable window as specified by the sponsor. These may be different for different parts of the doorset or openable window e.g. leading edge to frame, hinged edge to frame, leaf top edge to frame, leaf bottom edge to frame/sill, meeting stiles, etc. The sponsor shall specify gaps for each part of the doorset or openable window as appropriate.

For example, a hinged door with a specified range of gaps between the leading edge and the frame of 3 mm to 8 mm shall be tested with gaps set between 5,5 mm and 8 mm between the frame and the leading edge of the door leaf.

If any individual measured gap for any particular part of the installed doorset or openable window is outside the required range for testing for category B field of direct application (5,5 mm to 8 mm in the example above), the sponsor will only be able to claim category A field of direct application for his declared tolerances, unless the following are applied:

- If any individual measured gap for any particular part of the installed doorset or openable window is greater than the maximum required for category B field of direct application (i.e. greater than 8 mm in the example above), then category B field of direct application may still be claimed providing the sponsor revises the declared maximum gap to the individual measured maximum value and thereby initiating a new evaluation according to the above principles.

In the example above, if the maximum gap is found to be 10 mm (instead of 8 mm) then the door shall be tested with gaps set between 6,5 mm and 10 mm between the frame and the leading edge of the door leaf.

- If any individual measured gap for any particular part of the installed doorset or openable window is smaller than the minimum required for category B field of direct application (i.e. less than 5.5 mm in the example above), then category B field of direct application may still be claimed if the sponsor's declared maximum gap is revised using the calculation below:

The maximum calculated gap (x) is given by:

$$x = \frac{c}{\left(\frac{a+b}{2}\right)} \times b$$

where:

Minimum declared gap = a

Maximum declared gap = b

Average measured gap = c (measurements taken in accordance with 10.1.2)

Where the calculation results in a value for x being different to the sponsor's declared maximum value then the lower of the two values shall be used in practice and shall be rounded to the nearest whole value.