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Preskusi požarne odpornosti nenosilnih elementov - 4. del: Obešene fasade - Delna fasada

Fire resistance tests for non-loadbearing elements - Part 4: Curtain walling - Part configuration

Feuerwiderstandsprüfungen für nichttragende Bauteile - Teil 4: Vorhangfassaden - Teilausführung

Essais de résistance au feu des éléments non-porteurs - Partie 4 : Murs rideaux - Configuration partielle

Ta slovenski standard je istoveten z: **prEN 1364-4**

ICS:

13.220.50	Požarna odpornost gradbenih materialov in elementov	Fire-resistance of building materials and elements
91.060.10	Stene. Predelne stene. Fasade	Walls. Partitions. Facades

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EUROPEAN STANDARD

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English Version

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 127.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 1364-4:2025) has been prepared by Technical Committee CEN/TC 127 “Fire safety in buildings”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1364-4:2014.

prEN 1364-4:2025 includes the following significant technical changes with respect to EN 1364-4:2014:

— Existing definitions updated and new definitions added, in order to avoid misleading interpretation of the standard;

— Extension of test specimen to bespoke curtain walling;

— Extension of the test specimen configuration (see 6.3) also to unitized curtain walling;

— General revision of Clause 13 “Field of direct application of test results” and of Annex B “test configurations”;

— Annex D “Field of direct application of test results for unitised construction” deleted.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

Introduction

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

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

1 Scope

This document specifies a method for determining the fire resistance of parts of curtain walling and of the perimeter seal. It examines the fire resistance to internal and external fire exposure of:

— the spandrel panel, i.e. downstand, upstand or a combination thereof;

— the perimeter seal;

— the fixing of the framing system (anchoring) used to attach the curtain walling to the floor element;

— combinations thereof.

NOTE 1 This document does not test fire spread that can be caused through cavities in the test specimen, i.e. inside of the mullions (see note to 9.1.2.3.3).

Results from tests according to this document form the basis for classification of curtain walling type A (see 3.3 for definition).

For curtain walling type B (see 3.4 for definition) results can be used to determine fire resistance of parts of a curtain walling to increase the field of application when previously tested to EN 1364-3. For intended classification EW and for corner/faceted specimens EN 1364-3 can be used.

This document does not cover double skin façades, over-cladding systems and ventilated façade systems on external walls. It does not deal with the reaction to fire behaviour of curtain walling.

This document is intended to be read in conjunction with EN 1363-1 and EN 1363-2 as well as EN 1364-3 for curtain walling type B.

As per the type of curtain walling covered by this document, these are the ones included in EN 13119.

NOTE 2 Annex A gives informative guidance on the principles of testing parts of curtain walling and the test method.

NOTE 3 When tests are made to examine single elements (e.g. perimeter seal), those elements are to be installed as part of a curtain walling system.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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, *Fire resistance tests — Part 1: General Requirements*

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

EN 1364-3, *Fire resistance tests for non-loadbearing elements — Part 3: Curtain walling - Full configuration (complete assembly)*

EN 13119, *Curtain walling - Terminology*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13501-2:2023, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance and/or smoke control tests, excluding ventilation services*

EN 13830, *Curtain walling - Product standard*

EN ISO 13943, *Fire safety - Vocabulary (ISO 13943)*

EAD 350141-00-1106:2017, *Fire stopping and fire sealing products – Linear joint and gap seals*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1363-1, EN 13119, EN 13830, EN ISO 13943 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

3.1
anchoring
devices used to fix brackets to the floor

3.2
associated wall construction
form of construction required to close the vertical side of the furnace

Note 1 to entry: This is not part of the test specimen.

3.3
curtain walling type A
curtain walling without fire-resistant glazing and/or fire-resistant panel outside the spandrel area

Note 1 to entry: This is fire resistant only in the spandrel area.

Note 2 to entry: The fire-resistant spandrel area can include any type of build-up material and layers (e.g. stone, thermal insulation, metal panel).

Note 3 to entry: The components of the curtain walling system that are not part of the fire-resistance spandrel area of the curtain walling are part of the test specimen, but not part of the fire classification.

3.4
curtain walling type B
curtain walling with fire-resistant glazing and/or fire-resistant panel outside the spandrel area - fully fire-resistant curtain walling

3.5
downstand
part of the spandrel area located down in relation to the supporting floor

Note 1 to entry: For more examples, see also Figure A.2.

3.6
fire-resistant glazing
glazing system consisting of one or more transparent or translucent panes with a suitable method of mounting, with e.g. frames, seals and fixing materials, capable of satisfying the appropriate fire resistance criteria

3.7
fire-resistant glass
glass product, (i.e. monolithic glass, laminated glass, insulating glass units), that when used in a glazed assembly, can have its performance determined and classified in accordance with EN 13501-2

Note 1 to entry: The term "insulating" when used as an insulating glass unit according to EN 1279-1, should not be confused with the term "insulation" used in EN 13501-2 classification standard for fire-resistant glazed element.

[SOURCE: EN 15254-4:2018]

3.8
fixing of the framing system
system used to attach the curtain wall to the supporting floor

Note 1 to entry: It contains the brackets but not the anchor or other devices used to fix the brackets to the floor.

Note 2 to entry: Fixing of the framing system is part of the structural fixing bracket as defined in EN 13119.

3.9
glass product range
group of fire-resistant glass (3.7) products, including products from one or more glass product families, e.g. monolithic glass, laminated glass, insulating glass units, defined and produced by one manufacturer for which the characteristic resistance to fire from any one product within the range is valid for all other products within this range

Note 1 to entry: The glass product families are defined in the relevant product standards.

3.10
glazing system material
all materials used to glaze the fire-resistant translucent or transparent spandrel panel (fire-resistant glass) into its frame, e.g. glazing strips, pressure plate, cover plate, setting blocks, gaskets and sealant

3.11
horizontally faceted curtain walling
curtain walling with an angle between horizontally adjacent infill panels at the common mullion

Note 1 to entry: See Figure 4.

3.12
insulating glass unit
IGU
assembly consisting of at least two panes of glass, separated by one or more spacers, hermetically sealed along the periphery, mechanically stable and durable

3.13
over-cladding system
protection system fixed to an external wall for weather protection

3.14
overrun time
time of fire resistance in minutes beyond the envisaged classification time, achieved in the test

3.15
perimeter seal
joint between the curtain walling and adjacent construction designed to give continuity at both the air and water barriers of the wall

Note 1 to entry: The seals are intended to prevent or to restrict the passage of fire (and/or hot smoke) between elements or components or to maintain the integrity and insulation performance of one or more fire separating elements at linear discontinuities for a specified duration and are designed either to accommodate movement or not to accommodate movement.

Note 2 to entry: See EAD 350141-00-1106.

3.16
spandrel area
area of a curtain walling between two horizontal zones, normally between glazing and concealing the edge of the supporting floor

Note 1 to entry: Typically, the spandrel area is consisting of a single spandrel panel but it can also be divided in two parts: upstand (3.21) and downstand (3.5). See also Figures 1 and 2.

3.17
spandrel panel
panel within the spandrel area

3.18
standard test specimen configuration
standard arrangement of curtain walling components in a test specimen

Note 1 to entry: See 6.3.2.

3.19
supporting floor
representation of a floor, forming part of the test construction, to allow the fixing of the test specimen of the curtain walling and the installation of the perimeter seal

3.20
test configuration
test arrangement of the test specimen into the furnace

Note 1 to entry: See Annex B.

3.21
upstand
part of the spandrel area located up in relation to the supporting floor

Note 1 to entry: For more examples, see also Figure A.2.

4 Test equipment

4.1 General testing principles

Table 1 defines which specific test configuration may be used for each part of the curtain walling depending on the type of fire exposure and type of curtain walling.

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

Table 1 — Test configurations and heating conditions

Product / component of curtain walling to be tested for classification	Type of curtain walling[a]	Heating conditions	Test configuration (see Annex B)	Surfaces
Spandrel panel (upstand, downstand or combinations thereof) and perimeter seal together	A	STC or ef [b]	1	S3
	B	STC	2	S2, S3
		STC or ef [b]	3	S1
Perimeter seal only (without testing spandrel panel)	A	STC	1, 4*	S2, S3[c]
	B	STC	2, 4*	S2, S3[c]

ef External fire curve as specified in EN 1363-2.

STC Standard temperature / time curve as specified in EN 1363-1.

* Test configuration 4 can be used for classification of perimeter seal only, according to EN 13501-2:2023 Clause 7.5.8 "*Linear seal*"

Note 1 to entry: For more information on the test configuration depending on the heating conditions and explanation, see Table A.1.

[a] For definition of type of curtain walling see 3.3 and 3.4

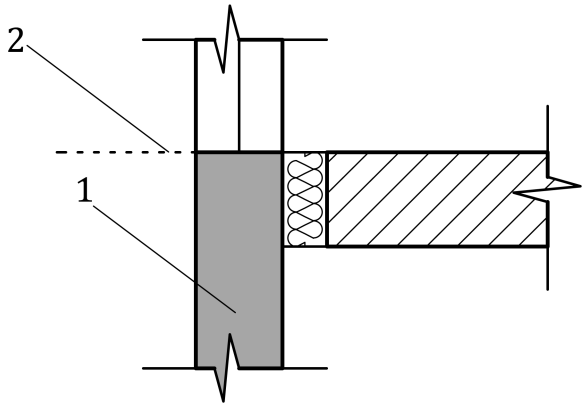
[b] Can be affected by national requirements.

[c] Measurements on these surfaces are not prescriptive and to be used for information only

4.2 Furnace configuration

A floor or a wall furnace may be chosen. The minimum dimensions of the furnace are given in Figures B.1 to B.4. For the installation of the specimen, wall or floor furnaces shall be modified, if necessary, to accommodate the three-dimensional construction. The three-dimensional construction includes the perimeter seal.

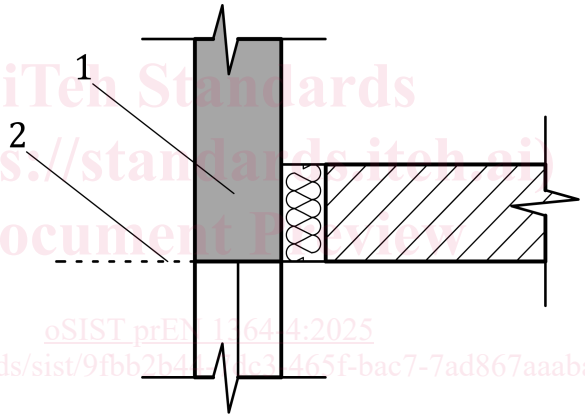
The test according to EN 1364-4 is performed on a three-dimensional specimen to allow an exposure of a number of surfaces of the upstand/downstand (spandrel area) and incorporates a supporting floor, which provides the support for the curtain walling.



Key

1 Downstand spandrel area
2 Separation of downstand and upstand

Figure 1 — Downstand spandrel area



Key

1 Upstand spandrel area
2 Separation of downstand and upstand

Figure 2 — Upstand spandrel area

4.3 Supporting floor

A supporting floor is provided as a base for the attachment of the fixing of the framing system and as a location for the perimeter seal under examination. If information on the fire resistance of the curtain walling in conjunction with a particular type of floor construction is required, such a construction shall be used, see 7.2.

The evaluation of fire resistance of the supporting floor is outside the scope of this document.

5 Test conditions

The pressure conditions and the furnace atmosphere shall conform to those given in EN 1363-1, subject to a nominal pressure of 20 Pa at the positions shown in Figures B.1 to B.4.

The heating conditions shall conform to those given in EN 1363-1 and/or EN 1363-2 for the test configuration selected as given in Table 1. For details see Annex B.

6 Test specimen

6.1 Size

The size of the test specimen shall be as follows:

a) the height of the spandrel area as in practice (normally about 1 m);

b) if the width of the curtain walling in practice is less than 3 m, the specimen shall be full size as in practice;

c) if the width of the curtain walling in practice is larger than 3 m, the width of the specimen shall be not less than 3 m.

NOTE 1 A width larger than 3 m can be the result of single panels with a width of more than 3 m or the result of the repetition of smaller construction units (mullion distance < 3m).

NOTE 2 Regarding the height of test specimens, national requirements can apply.

Where the width of a single spandrel panel (upstand/downstand) is less than 3 m, at least 3 panels with the mid panel at the maximum dimension shall be incorporated in the test specimen. Where the width of the panel is greater than or equal to 3 m, at least 3 panels with the mid panel at the maximum width shall be incorporated in the test specimen. The outer panels may be cut and not be protected any more than they would be in practice, a minimum distance of 200 mm between the furnace wall and the second mullion shall be guaranteed.

The height *h* is the total of upstand and downstand (spandrel area).

If the height of the test specimen is smaller than the vertical opening of the furnace, the furnace opening shall be closed with a furnace closure according to 7.3.

6.2 Number of specimens

The performance of curtain walling or parts of curtain walling type A for internal and external exposure- shall be determined from a single test where the specimen is heated from both sides. For details see Annex B. For curtain walling type B, separate tests shall be performed for internal and external exposure.

NOTE The external exposure can be the external fire curve as specified in EN 1363-2 or the standard temperature/time curve as specified in EN 1363-1.

6.3 Design

6.3.1 General

This clause applies to both situations of bespoke curtain walling and standard curtain walling test specimen.

The test specimen shall be:

— either fully representative of the construction intended for use in practice, including fixing of the framing system, expansion joints, perimeter seals, any surface finishes and fittings which are essential and may influence its behaviour in the test, or

— a standard test specimen configuration according to Annex B.