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Fire resistance tests for device installations - Part 14: Partial penetration seals

Feuerwiderstandsprüfungen für Installationen - Teil 14: Partielle Abschottungen

Essais de résistance au feu des installations techniques - Partie 14 : Calfeutremments de trémies partielles

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**Fire resistance tests for device installations - Part 14:
Partial penetration seals**

Essai de résistance au feu des installations - Partie 14 :
Joints de pénétration partielle

Feuerwiderstandsprüfungen für Installationen - Teil
14: Teilabschottungen

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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prEN 1366-14:2024 (E)**European foreword**

This document (prEN 1366-14:2023) 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 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.

EN 1366 ‘Fire resistance tests for device installations’ consists of the following Parts:

- Part 1: Ducts
- Part 2: Fire dampers
- Part 3: Penetration seals
- Part 4: Linear joint seals
- Part 5: Device ducts and shafts
- Part 6: Raised access and hollow core floors
- Part 7: Conveyor systems and their closures
- Part 8: Smoke extraction ducts
- Part 9: Single compartment smoke extraction ducts
- Part 10: Smoke control dampers
- Part 11: Fire protective systems for cable systems and associated components
- Part 12: Non-mechanical fire barrier for ventilation ductwork
- Part 13: Chimneys
- Part 14: Partial penetration seals (this document)

1 Scope

This part of the EN 1366 series specifies a method of test and criteria for the evaluation (including field of direct application rules) of the ability of a partial penetration seal to maintain the fire resistance of a separating element at the position at which it has been penetrated by a device or devices that passes through one face of the element only. Partial penetration seals are used to seal apertures for electrical sockets, downlighters, media devices, cables and any item which requires an opening to be made in one face of the element of construction but does not include a device which passes through both faces. Supporting constructions are used in this part of the EN 1366 series to represent separating elements such as walls or floors. These simulate the interaction between the test specimen and the separating element into which the sealing system is to be installed in practice.

This part of the EN 1366 series is used in conjunction with EN 1363-1.

The purpose of a test described in this part of the EN 1366 series is to assess the integrity and insulation performance of the partial penetration seal, of the penetrating service(s) or device(s) and of the separating element in the surrounding area of the partial penetration seal. Where partial penetration seals are installed in ceilings and floors, the loadbearing capacity shall also be considered.

No information can be implied by the test concerning the influence of the inclusion of such penetrations and penetration seals on the loadbearing capacity of walls.

It is not the intention of this test to provide quantitative information on the rate of leakage of smoke and/or hot gases or on the transmission or generation of fumes. Such phenomena are only to be noted in the test report in describing the general behaviour of test specimens during the test.

Tests in accordance with this part of the EN 1366 series are not intended to supply any information on the ability of the partial penetration seal to withstand stress caused by movements or displacements of the penetrating devices.

The risk of spread of fire downwards cannot be assessed with this test.

Tests in accordance with this part of the EN 1366 series do not address any risks associated with leakage of dangerous liquids or gases caused by failure of the device in case of fire.

2 Normative references

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<https://standards.iteh.ai/catalog/standards/sist/8969de9a-dd65-46a5-a8b2-3bc527c21cf7/osist-pren-1366-14-2024>

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 520, *Gypsum plasterboards — Definitions, requirements and test methods*

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

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

EN 1365-2, *Fire resistance tests for loadbearing elements — Part 2: Floors and roofs*

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

EN 13501-2, *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 ISO 13943, *Fire safety — Vocabulary (ISO 13943)*

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EN IEC 60670-1, *Boxes and enclosures for electrical accessories for household and similar fixed electrical installations — Part 1: General requirements (IEC 60670-1)*

3 Terms and definitions

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

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

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1**back to back**

devices installed on both faces of a vertical construction within 200 mm of each other vertically or horizontally (in the plane of the wall)

3.2**device**

electrical or mechanical equipment which penetrates one face of the separating element, often at the termination of a service, e.g. electrical socket or recessed media equipment

3.3**flexible construction**

horizontal or vertical supporting construction consisting of studs or joists, including linings and optional insulation

3.4**offset**

distance between the centres two partial penetration seals in opposite faces of the element of construction

3.5**partial penetration**

service(s) or device(s) that penetrate(s) one face of the separating element but does not pass completely through the element

3.5.1**small partial penetration**

partial penetration with an area of up to 0,025 m²

3.5.2**medium partial penetration**

partial penetration with an area greater than 0,025 m² up to 0,12 m²

3.5.3**large partial penetration**

partial penetration with an area greater than 0,12 m²

3.6

partial penetration seal

system used to maintain the fire resistance of a separating element at the position where one or more services or devices pass through one face of a separating element

3.7

separation

distance between the closest extremities two partial penetration seals in the same face of the element of construction

3.8

supporting construction

wall or floor construction used to support the penetration seal being evaluated

3.9

test specimen

assembly for the fire test consisting of the penetrating service(s) or device(s) and the partial penetration seal materials or partial penetration seal devices

3.10

wall segment

section of a stud wall between adjacent studs

4 Test equipment

See EN 1363-1, and if applicable EN 1363-2.

5 Test conditions

5.1 Heating conditions

The heating and furnace atmosphere shall conform to those given in EN 1363-1 or, if applicable, EN 1363-2.

5.2 Pressure conditions

A vertical furnace shall be operated so that a minimum pressure of 10 Pa exists in the centre of the test specimen mounted in the lowest position on the exposed side of the wall.

A horizontal furnace shall be operated so that a pressure of (20 ± 3) Pa is established at a position (100 ± 10) mm below the lowest point of the test construction.

5.3 Loading conditions (floors only)

The test specimen shall be subjected to loads determined in accordance with EN 1365-2 and EN 1363-1. The determination of the load shall be clearly indicated in the test report.

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6 Test specimen

6.1 Size and distances

Partial penetration seals for walls shall be tested in a wall with minimum dimensions of 3 m high \times 1,2 m wide.

Partial penetration seals for ceilings shall be tested in a floor/ceiling construction, with minimum dimensions of 4 m \times 3 m (with a minimum span of 4 m).

In order to avoid boundary effects, the distance between the perimeter of the partial penetration seal and the internal surfaces of the furnace shall be not less than 200 mm at any point.

Separation of partial penetration seals installed within the same face of a wall construction shall comply with the following:

- a) partial penetration seals that are intended to be evaluated separately shall be separated by a minimum 200 mm vertically or horizontally in the plane of the wall, unless the separation distance used in practice is less, in which case the actual separation distance shall be used;
- b) partial penetration seals that are intended to be evaluated with interaction, shall be tested with a separation of less than 200 mm (vertically or horizontally in the plane of the wall), unless the separation distance used in practice is less. In each case the actual separation distance used shall be the desired minimum separation;
- c) the distances between partial penetration seals shall be recorded in the test report wherever this is less than 200 mm (horizontally or vertically in the plane of the wall).

Separation of partial penetration seals installed within the opposite faces of a wall construction shall comply with the following:

- a) the centre point of partial penetration seals that are intended to be evaluated separately shall be separated by a minimum 200 mm vertically or horizontally in the plane of the wall, unless the separation distance used in practice is less, in which case the actual separation distance shall be used;
- b) partial penetration seals that are intended to be evaluated with interaction, shall be tested with a separation of less than 200 mm (vertically or horizontally in the plane of the wall), unless the separation distance used in practice is less. In each case the actual separation distance used shall be the desired minimum separation;
- c) the distances (both vertical and horizontal in the plane of the wall) between the centre points of partial penetration seals shall be recorded in the test report wherever this is less than 200 mm (horizontally or vertically in the plane of the wall).

Annex F provides an alternative test method for partial penetrations seals in wall or floor constructions that have already been subject to a fire test.

6.2 Number of test specimens

In the case of vertical elements, a minimum two installations shall be carried out, one for each direction of exposure.

In the case of horizontal elements, the test specimen shall be exposed to heating from the underside.

7 Installation of test specimen

7.1 General

The test specimen(s) shall be installed, as far as possible, in a manner representative of their use in practice, including any associated required wiring etc. Care shall be taken to avoid any artificial support which could be provided to the device, e.g. if it sags during the test.

When more than one test specimen is incorporated into a single supporting construction, care shall be taken to ensure that there is no interaction between different test specimens, except if the determination of the interaction is the intention of the test.

7.2 Supporting construction

7.2.1 Standard flexible wall constructions

The standard supporting construction shall be in accordance with the provisions given in EN 1363-1, except where modified by provisions within this document.

The size of the flexible wall shall be as defined in 6.1. The wall shall be restrained only on the top and bottom edge. A construction omitting insulation shall be used.

The overall thickness and number of the gypsum board(s) shall be as given in Table 1. Steel studs of varying widths may be used to fit the flexible wall constructions defined in Table 1. At the discretion of the test sponsor, a lower specification for any of the parameters in Table 1 may be selected for the test and the direct field of application rules applied relative to the tested parameters.

Table 1 — Standard flexible wall constructions

Intended fire resistance	Steel stud depth [mm]	Gypsum board type F in accordance with EN 520		Overall wall thickness [mm]
		Number of layers at each side	Thickness of boards [mm]	
EI 30	44—55	1	12,5	69—80
EI 60	44—55	2	12,5	94—105
EI 90 or EI 120	44—55	2	12,5 ^a	94—105
EI 120	62—70	2	15	122—130

^a Restrictions to the field of direct application apply. See 13.2.2. If for EI 90 walls it is intended to cover walls with only one layer of board on each side, a wall with a gypsum board with a thickness of 25 mm may be used in the test.

7.2.2 Flexible floor/ plasterboard ceiling constructions

7.2.2.1 General

Currently there is no defined standard supporting construction for flexible floors/plasterboard ceiling constructions, however Annex G (informative) provides guidance for timber joist constructions that may