



SLOVENSKI STANDARD

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Extended applications of results from fire resistance tests for service installations - Part
3: Penetration seals

Erweiterter Anwendungsbereich der Ergebnisse aus Feuerwiderstandsprüfungen für
Installationen - Teil 3: Abschottungen

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ICS:

13.220.50	Požarna odpornost gradbenih materialov in elementov	Fire-resistance of building materials and elements
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 15882-3

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ICS 13.220.50

English Version

Extended applications of results from fire resistance tests for service installations - Part 3: Penetration seals

Application étendue des résultats des essais de résistance
au feu - Partie 3 : Calfeutrements

Erweiterter Anwendungsbereich der Ergebnisse aus
Feuerwiderstandsprüfungen - Teil 3 : Abschottungen

This European Standard was approved by CEN on 11 January 2009.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 15882-3:2009) 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of an identical text or by endorsement, at the latest by September 2009, and conflicting national standards shall be withdrawn at the latest by September 2009.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 was submitted to Enquiry under the reference prEN 15080-14.

EN 15882 "Extended applications of results from fire resistance tests for service installations" consists of the following Parts:

- Part 1: Fire resisting ducts
- Part 2: Dampers
- Part 3: Penetration seals
- Part 4: Linear joint seals

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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 EC Directive(s).

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 15882-3:2009 (E)**1 Scope**

The purpose of this European Standard is to provide the principles and guidance for the preparation of extended application documents for penetration sealing systems tested in accordance with EN 1366-3. The field of the extended application document is additional to the direct field of application given within EN 1366-3 and may be applied to or based on a single test, or a number of tests, which provide the relevant information for the formulation of an extended application.

It should be noted that this European Standard provides general guidance on the likely effects of a change. It gives no guidance as to the magnitude, nor how this magnitude is evaluated.

Composite pipes comprising both metallic and plastics components are not covered by this European Standard.

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 1363-2:1999, *Fire resistance tests — Part 2: Alternative and additional procedures*

EN 1366-3: 2004, *Fire resistance tests for service installations — Part 3: Penetration seals*

EN 13501-1:2007, *Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire tests*

EN 13501-2:2007, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

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 1363-2:1999, EN 1366-3:2004, EN 13501-1:2007, EN 13501-2:2007, EN ISO 13943:2000 and the following apply.

3.1**bellows seal**

flexible seal, often based on a coated fabric sleeve, to allow movement of services

3.2**block**

product available in a variety of shapes and sizes. Generally cuboid for rectangular penetrations

3.3**bus bar**

low impedance conductor to which several electric circuits can be connected

NOTE See IEC 60439-1.

3.4**cable box**

consists of a metal frame with intumescent inlays that form a type of channel with lids

3.5**cable bundles**

Several cables running in the same direction and bound closely together by mechanical means

3.6**collar**

see pipe closure devices (3.14)

3.7**conduit**

metal or plastic casing designed to accommodate cables. Normally a conduit is circular or oval in section. See also trunking (3.26)

3.8**foam seal**

seal made from a material that cures at room temperature, increasing its volume upon application

3.9**metal pipes type 1**

metallic pipes and conduits of reaction to fire class A1 according to EN 13501-1 with a melting or decomposition point greater than 1000°C (e.g. steel, cast iron, copper and copper alloys, nickel alloys), either insulated or non-insulated. Included in this group are the above pipes with a coating provided the overall reaction to fire class is minimum A2

3.10**metal pipes type 2**

metallic pipes and conduits of reaction to fire class A1 or A2 according to EN 13501-1 with a melting or decomposition point equal to or less than 1000°C (e.g. lead, aluminium and aluminium alloys), either insulated or non-insulated

3.11**modular system**

system comprising a steel frame into which elastomeric blocks are installed, compressed around the service.

3.12**mortar**

blend of gypsum or cement based powder, fillers, water and chemical modifiers, with or without reinforcement

3.13**pillow (also referred to as bag or cushion)**

deformable, pillow-like bag, filled with reactive or non-reactive material, for the temporary or permanent closing of penetrations or openings. Examples of filling materials are glass and mineral wool, vermiculite, sand, organic and inorganic foams with or without intumescent or ceramising additives

3.14**pipe closure devices**

pre-fabricated, heat activated device that, under fire exposure, acts to crush plastic pipes or service ducts that pass through vertical or horizontal separating elements and/or fill the hollow space with an intumescent foam

NOTE Three types are considered here: collars, wraps and sleeves:

Collars incorporate an outer casing which acts as a restraint for an intumescent material, enabling the collar to be either surface fixed to the separating element or incorporated within it;

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Wraps have no casing and hence must be located within the separating element, which acts as a restraint for the intumescent;

Sleeves pass completely through the separating element and may include an outer casing.

3.15**pipe diameter**

nominal external diameter of the service pipe

3.16**plastic pipes**

pipes not classified to A1 or A2 according to EN 13501-1 (e.g. made from thermoplastic or thermosetting material) including non-homogeneous materials (e.g. glass fibre reinforced plastic pipes or layered pipes), either insulated or non-insulated, hereafter referred to as "plastic pipes".

3.17**plug**

as block (3.2), but cylindrical/conical in shape (for circular penetrations)

3.18**interrupted insulation**

pipe insulation that does not pass through the seal

3.19**sustained insulation**

pipe insulation that passes through the seal

3.20**putty**

material similar to some sealants/mastics, capable of being formed and directly installed by hand, but remaining in a plastic condition

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3.21**seal depth**

shortest distance between the exposed and unexposed surfaces of the seal

3.22**seal thickness**

shortest distance between the surface of the service and the surrounding aperture

3.23**sealant/mastic, flexible**

single or multi-component material, comprising organic and/or inorganic fillers pre-dispersed in a binder (i.e. acrylic, polysulphide, silicone, etc) that cures or dries after application to an elastic or plasto-elastic material

3.24**service support construction**

mechanical support provided in the form of clips, ties, hangers, ladder racks or trays, or any device designed to carry the load of the penetrating services

3.25**sleeves**

see pipe closure devices (3.14)

3.26**trunking**

metal or plastic casing with a removable lid designed to accommodate cables. Normally square or rectangular in section (also see conduit 3.7)

3.27**waveguide**

circular, elliptical or rectangular metal tube or pipe or a coaxial assembly of tubes/pipes through which electromagnetic waves are propagated in microwave and radio wave frequency communications

3.28**working clearances**

distances between services or between services and the seal edge

3.29**wrap**

see pipe closure devices (3.14)

4 Extended application principles**4.1 General**

Due to the diverse nature of materials and constructions used to seal openings in fire resistant separating elements it has been necessary to separate the extended application principles into generic seal types. Where more than one variation is to be incorporated the overall effect shall be considered. Principles common to all generic seal types are given in 4.2. Principles and guidance relating to each specific generic seal type are given in Annex A. Annex B provides guidance on the application of test results on plastic pipe seals.

Variables for each seal type, which require consideration, are included in this report. These are as follows:

- 1) Separating element;
- 2) Type of service;
- 3) Size of service; <https://standards.iteh.ai/catalog/standards/sist/0e94f30a-4afe-4e45-9d93-8bfb6d447b55/sist-en-15882-3-2009>
- 4) Seal size and configuration.

Each sub-clause gives the possible variation and the rule relating to the variation.

4.2 Principles common to all generic seal types

The rules given in the following sub-clauses are applicable to all generic penetration seal types incorporated in Annex A, unless stated otherwise in the specific section.

Table 1 – Seal material (primary generic penetration seal material as per Annex A)

Variation	Rules
Change of material(s) comprising parts of the sealing system	Not permitted unless otherwise specifically stated in Annex A

Table 2 – Separating elements — Concrete or masonry

Variation	Rules
Decrease in thickness and/or density	Not permitted
Increase in thickness	Permitted except in the case of pipe closure devices where specific rules regarding the position of the seal within the separating element are outlined in the relevant section

Table 3 – Separating elements – Flexible constructions

Variation	Rules
Decrease in thickness	Not permitted
Increase in thickness	Permitted except in the case of pipe closure devices where specific rules regarding the position of the seal within the separating element are outlined in the relevant section
Change of the flexible construction	Constructions not defined in EN 1366-3 shall be tested
Change of wall lining material	Permitted if the lining has an equal or greater thickness, reaction to fire class and the alternative flexible wall construction has an equivalent or greater fire resistance
Increase in wall lining thickness	Permitted
Decrease in wall lining thickness	Not permitted
Change in aperture framing (design, etc.)	Not permitted
Change in aperture framing material	Permitted provided reaction to fire class, thickness and mechanical strength are equal or greater than tested
Change of insulation material (density, thickness or type)	Not permitted

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Table 4 – Penetrating services – Changes to service items – Metal pipes type 1

Variation	Rules
Change of type of pipe material	Permitted provided melting point is equal to or greater than that tested and thermal conductivity equal to or less than that tested
Change of pipe dimensions	Permitted between the diameters tested and wall thicknesses tested
Insulated pipes	Data relating to insulated pipes shall not be used to support assessments in respect of non-insulated pipes and vice versa.
Change of insulation material	For pipes with sustained insulation a change of insulation material is not permitted For pipes with interrupted insulation the insulation material may be changed within the same generic type, such as stone wool, glass wool, PVC etc. where the alternative provides an equal or superior reaction to fire classification
Change in thickness and/or density of insulation material to insulated pipes	Not permitted
Increase in length of applied insulation	Permitted
Decrease in length of applied insulation	Not permitted

Table 5 – Plastic pipes

Variation	Rules
Change of type of pipe material	Not permitted with the exception of PVC which is permitted based on tests on PE and PP of the same size (range) up to a maximum nominal pipe diameter of 160 mm
Change in pipe dimensions	Permitted within the diameter and wall thickness range tested provided the seal thickness and depth remains the same across the pipe dimension range. In the case of pipe closure devices this refers to the thickness and length of the intumescent component.

Annex B provides further information for extended application of test results of plastic pipes.

Table 6 – Cables – Single cables / bundles not tested to standard configuration

Variation	Rules
Increase in size	Single cables: permitted up to 25% Bundle diameter: permitted up to 10%
Decrease in size	Single cables or bundles — permitted subject to meeting $\pm 10\%$ of the tested conductor to cable CSA ratio (CSA = cross sectional area)
Increase in conductor cross sectional area (CSA)	Permitted — up to 10%
Change of generic conductor material.	Not permitted
Change of type of insulation material.	Not permitted

Table 7 – Cable trunking

Variation	Rules
Decrease in size	Permitted subject to not exceeding the ratio of overall cross sectional area (CSA) of cable(s) to the internal CSA of the trunking used in the test
Inclusion of trunking	If cable trunking has not been included in tests, results from non-perforated lidded cable trays of same generic material and thickness may be used. The width and height of the trunking shall not exceed the maximum cable tray width and height. Where an internal seal was used within the cable tray it shall also be provided within the trunking. CSA of cable(s) may be up to 60% of the internal CSA of the trunking.

Table 8 – Conduits

Variation	Rules
	As pipes (steel or plastic as appropriate)