
**Požarna klasifikacija gradbenih proizvodov in elementov stavb - 3. del:
Klasifikacija na podlagi podatkov iz preskusov požarne odpornosti proizvodov in
elementov servisnih inštalacij in električnih kablov v stavbah**

Fire classification of construction products and building elements - Part 3: Classification using data from fire resistance tests on products and elements used in building service installations and electrical cables

Klassifizierung von Bauprodukten und Bauarten zu ihrem Brandverhalten - Teil 3: Klassifizierung mit den Ergebnissen aus den Feuerwiderstandsprüfungen an Bauteilen von haustechnischen Anlagen und elektrischen Kabeln

Classement au feu des produits et éléments de construction - Partie 3 : Classement utilisant des données d'essais de résistance au feu de produits et éléments utilisés dans des installations techniques et des installations de câbles électriques

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91.060.40	Dimniki, jaški, kanali	Chimneys, shafts, ducts

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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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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (prEN 13501-3:2019) 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 13501-3:2005+A1: 2009.

This document has been prepared under a Mandate given to CEN by the Commission of the European Communities and the European Free Trade Association.

CEN, CENELEC and EOTA committees preparing technical specifications which contain performance requirements against fire resistance tests should make reference to the fire resistance classification given in this document and not refer directly to any specific fire test method.

EN 13501 consists of the following parts:

- *Part 1: Classification using data from reaction to fire tests,*
- *Part 2: Classification using data from fire resistance tests, excluding ventilation services,*
- *Part 3: Classification using data from fire resistance tests on products and elements used in building service installations and electrical cables;*
- *Part 4: Classification using data from fire resistance tests on components of smoke control systems,*
- *Part 5: Classification using data from external fire exposure to roofs tests.*
- *Part 6: Classification using data from, reaction to fire tests on power, control and communication cables*

Introduction

The aim of this document is to define a harmonized procedure for the classification for resistance to fire of construction products and elements. This classification is based on the test procedures listed in Clause 2 and the relevant field of application procedures.

This document is prepared in support of the second essential requirement in the EC Construction Products Regulation (305/2011), which is detailed in the Interpretative Document number 2 (ID2): Safety in case of fire (OJ C62 Vol 37). It reflects the Commission Decision (EU) 20XX/XXX of DD MM 20XX as regards the classification of the resistance to fire performance of construction products, construction works and parts thereof. DD MM 20XX specify performance and classes regarding fire resistance. These classes are identified by designation letters, each of which refers to an important characteristic of fire resistance behaviour.

This document provides for a common understanding for these requirements. It interprets the functional requirements for the different groups of building products and elements and explains the method for deriving their classification on the basis of test results and/or extended application results for individual products or elements.

NOTE Test reports constitute the basis for extended application reports as explained in EN 15725.

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1 Scope

This document specifies the procedure for classification of the resistance to fire performance of construction products and building elements used as components of building service installations, using data from fire resistance tests which are within the direct field of application of the relevant test method. Classification on the basis of extended application of test results is also included in the scope of this document.

Products/elements for use in ventilation systems include (excluding smoke and heat exhaust ventilation):

- fire resisting ducts;
- fire dampers.

Products /elements for use in/as cables systems:

- Intrinsic fire resistant cables/unprotected cables;
- Fire protective systems for cable systems;
- Supporting /suspension devices;
- Associated components (connectors, glands, junctions, etc.)

Relevant test methods which have been prepared for these products/elements are listed in Clause 2.

2 Normative references

<https://standards.iteh.ai/catalog/standards/sist/38c7a5ea-be91-4769-a8b9-369eb60c1313>

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 1366-1:2014, *Fire resistance tests for service installations — Part 1: Ventilation ducts*

EN 1366-2:2015, *Fire resistance tests for service installations — Part 2: Fire dampers*

EN 1366-11, *Fire resistance tests for service installations — Part 11: Fire protective systems for cable systems and associated components*

EN 15725, *Extended application reports on the fire performance of construction products and building elements*

EN 50200, *Method of test for resistance to fire of unprotected small cables for use in emergency circuits*

EN 50289-4-16, *Communication cables — Specifications for test methods — Part 4-16: Environmental test methods — Circuit integrity under fire conditions*

EN 50577, *Electric cables — Fire resistance test for unprotected electric cables (P classification)*

EN 50582, *Procedure to assess the circuit integrity of optical fibres in a cable under resistance to fire testing*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

**3.1
direct field of application**
outcome of a process (involving the application of defined rules) whereby a test result is deemed to be equally valid for variations in one or more of the product properties and/or intended end use applications

**3.2
extended field of application**
outcome of a process (involving the application of defined rules that may incorporate calculation procedures) that predicts, for a variation of a product property and/or its intended end use application(s), a test result on the basis of one or more test results to the same test standard

**3.3
test specimen**
element (or part) of building construction provided for the purpose of determining either its fire resistance or its contribution to the fire resistance of another building element

[SOURCE: EN 1363-1:2012]

Note 1 to entry: For the purposes of this document, this definition refers to a specific component of a service installation.

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**3.4
fire resisting duct**
duct used for the distribution or extraction of air and designed to provide a degree of fire resistance

Note 1 to entry: Fire resisting ducts may be subject to an additional classification S: smoke leakage.

[SOURCE: EN 1366-1:2014]

**3.5
fire damper**
mobile closure within a duct which is designed to prevent the passage of fire

Note 1 to entry: Fire dampers may be subject to an additional classification S: smoke leakage.

[SOURCE: EN 1366-2:2015]

**3.6
extended application result**
predicted result for performance parameter obtained following the process of extended field of application

3.7**extended application report**

document reporting extended application results, including all details of the process leading to those results

Note 1 to entry: Extended application reports are prepared in accordance with EN 15725.

3.8**fire protective systems**

heat insulating assembly of flexible or rigid materials inside which cables or cable systems are arranged

Note 1 to entry: The protective system may be ducts, shafts, conduits, trunkings, jacket enclosures or similar systems.

3.9**electrical cables**

power, control and communication cables, including optical fibre cables and hybrid cables which are a combination of two or more of these cable types

3.10**small electrical cables**

power, control and communication cables, including optical fibre cables and hybrid cables with an overall diameter not exceeding 20 mm and with conductor size up to and including 2,5mm²

Note 1 to entry: For optical cables only the 20 mm diameter limit applies

3.11**cable management system (CMS)**

assembly including different system components intended for the accommodation of insulated conductors, cables and possibly other electrical equipment in electrical and/or communication systems

4 Fire scenarios**4.1 General**

Fire resistance shall be assessed using the thermal attack given in 4.2. The levels of thermal action given in 4.2 and 4.3 reflect different fire scenarios and the standards which prescribe their translation into practical tests give tolerances for their application.

NOTE Other heating curves can exist:

- 'smouldering' fire test is only used if the fire resistance performance of the product/element is expected to be reduced by exposure to temperatures associated with the growth stage of a fire. It is, therefore, particularly relevant to products/elements whose performance could be dependent upon high heating rates below approximately 500 °C (as provided during the 'standard temperature/time' curve) for achievement of their classifications (i.e. mainly reactive or intumescent products). Further details relating to the practical application of this curve, and other test parameters, e.g. tolerances, are given in EN 1363-2;
- hydrocarbon curve is another example;
- also for extreme fire scenarios (e.g. traffic tunnels and nuclear plants), more severe conventional curves can be specified. These are not, however, used for the classification of elements according to this document.

prEN 13501-3:2019 (E)**4.2 The standard temperature/time curve (post flashover fire)**

When applied as a basis for testing, the standard temperature/time relationship shall be applied for the full duration of the test. The relationship, which is a model of a fully developed fire in a compartment, is given by the following relationship:

$$T = 345 \log_{10}(8t + 1) + 20 \quad (1)$$

where

t is the time from the start of the test in minutes, and

T is the mean furnace temperature in °C.

Further details relating to the practical application of this curve, and other test parameters, e.g. tolerances, are given in EN 1363-1.

4.3 Constant temperature attack at 842°C

In addition to the heating regime given in 4.2, the evaluation of small diameter unprotected electrical cables made using a notional constant temperature attack is carried out by means of flame single burner attack instead of furnace testing. The specified temperature and the rate at which the temperature is reached, is specified in the relevant test method.

5 Resistance to fire performance characteristics

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5.1 Performance characteristics**5.1.1 Introduction**

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5.1.2 to 5.1.4 describe which performance characteristics apply to which products/elements.

5.1.2 E - Integrity

Integrity E is the ability of a component of a service installation to prevent the transmission of fire as a result of the passage of significant quantities of flames or hot gases from the fire to the unexposed side, thereby causing ignition either of the non-fire exposed surface or of any material adjacent to that surface.

The assessment of integrity is made on the basis of one or more of the following aspects simultaneously:

- cracks or openings in excess of given dimensions;
- ignition of a cotton pad;
- sustained flaming on the unexposed side;
- leakage in excess of given values.

The integrity shall be determined by all methods during the test. The cotton pad procedure shall be applied until the pad ignites and, once it has ignited, it shall be withdrawn and the test continued until all aspects have been exceeded (the sponsor has the option, however, of stopping the test once the desired level has been reached). The times of each mode of integrity failure shall be recorded.

Classification of integrity is according to whether or not the component is also classified for insulation. Where a component is classified both for integrity E and insulation I, the integrity value shall be that determined by whichever of the four criteria fails first. Where a component is classified E but without an I classification, failure of the cotton pad shall not be taken into account.

When testing fire dampers or fire resisting ducts against the slow heating curve (EN 1363-2), the leakage criteria are applicable. However, the leakage rates measured during the first 25 min of the test shall be disregarded.

For dampers, cracks or openings, ignition of cotton pad and sustained flaming on the unexposed side shall be taken into account only for the area around the duct and wall or floor junction. The criterion inside the duct containing the damper shall be the limitation of the leakage rate to $360 \text{ m}^3/(\text{m}^2 \cdot \text{h})$ after the first five minutes of exposure to the standard temperature/time curve.

5.1.3 I – Insulation

Insulation I is the ability of a component of a service installation to withstand fire exposure without the transmission of fire as a result of significant transfer of heat. Transmission shall be limited so that unexposed surfaces or any material in close proximity to those surfaces are not ignited. The component shall also provide a barrier to heat, sufficient to protect people near to it.

5.1.4 S – Smoke leakage

Smoke leakage S is the ability of the component to resist the passage of gases or smoke at ambient temperature and during exposure to the standard temperature/time test. The leakage rate is corrected to 20 °C.

5.1.5 P-Continuity of power and/or signal supply

Continuity of power and/or signal supply P is the ability to provide such continuity under the conditions of the standard temperature/time curve (see 4.2).

5.1.6 PH - Continuity of power and/or signal supply

Continuity of power and/or signal supply PH is the ability of a small electrical cables to maintain a reliable form of power supply or signal from the source to the safety installation(s) when exposed to a constant flame temperature attack of a notional 842°C (see 4.3)

6 Declaration of fire resistance performance

6.1 Classification periods

All classification periods against any of the characteristics shall be declared in minutes using one of the periods 15, 20, 30, 45, 60, 90, 120, 180 or 240.

NOTE Not all periods apply to all components, and further subclauses show which classification periods apply to which products/elements.

6.2 Designatory letters

For the classification of components of service installations, use shall be made of the designatory letters explained in 5.1.