SLOVENSKI STANDARD
SIST EN 13501-4:2016

01-september-2016

Nadomešča:
SIST EN 13501-4:2007+A1:2009

Požarna klasifikacija gradbenih proizvodov in elementov stavb - 4. del: Klasifikacija na podlagi podatkov iz preskusov požarne odpornosti elementov sistemov za nadzor dima

Fire classification of construction products and building elements - Part 4: Classification using data from fire resistance tests on components of smoke control systems

Klassifizierung von Bauprodukten und Bauarten zu ihrem Brandverhalten - Teil 4: Klassifizierung mit den Ergebnissen aus den Feuerwiderstandsprüfungen von Anlagen zur Rauchfreihaltung

Classement au feu des produits et éléments de construction - Partie 4: Classement à partir des données d'essais de résistance au feu des composants de dispositifs de contrôle de fumée

Ta slovenski standard je istoveten z: **EN 13501-4:2016**

ICS:

13.220.50	Požarna odpornost gradbenih materialov in elementov	Fire-resistance of building materials and elements

SIST EN 13501-4:2016 **en,fr,de**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13501-4

June 2016

ICS 13.220.50

Supersedes EN 13501-4:2007+A1:2009

English Version

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This European Standard was approved by CEN on 23 April 2016.

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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-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
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Ref. No. EN 13501-4:2016 E

Contents

Page

European foreword

This document (EN 13501-4:2016) has been prepared by Technical Committee CEN/TC 127 "Fire safety in buildings", the secretariat of which is held by BSI.

This document supersedes EN 13501-4:2007+A1:2009.

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of an identical text or by endorsement, at the latest by December 2016, and conflicting national standards shall be withdrawn at the latest by March 2018.

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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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

EN 13501 *Fire classification of construction products and building elements* 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: fire resisting ducts and fire dampers*

— *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 roof tests*

— *Part 6: Classification using data from reaction to fire tests on electric cables*

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

Introduction

This European Standard defines a harmonized procedure for the classification for resistance to fire of construction products. This classification is based on the test procedures sited in the relevant documents listed in Clause 2 and the relevant field of application procedures.

This European Standard is prepared in support of the second basic requirement, in the EC Construction Products Regulation (305/2011) and is detailed in the Interpretative Document number 2 (ID2): Safety in case of fire (OJC62 Vol 37).

The Interpretative Document and the Commission Decision of 3 May 2000 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 European Standard provides for a common understanding for these requirements. It interprets the functional requirements for the different groups of building products/elements and explains the method for deriving their classification on the basis of test results and/or extended application results for individual products/elements.

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

1 Scope

This European Standard specifies the procedure for classification of components of smoke control systems, using data from fire resistance tests which are within the field of application of the relevant test methods. Classification on the basis of extended application of test results is also included in the scope of this European Standard.

Products covered by this European Standard are:

— smoke control ducts;

— smoke control dampers;

— smoke barriers;

— powered smoke and heat control ventilators (fans), including connectors;

— natural smoke and heat exhaust ventilators.

Relevant documents which include the relevant test methods which have been prepared for these products are listed in Clause 2.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 1366-1, *Fire resistance tests for service installations - Part 1: Ventilation ducts*

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

EN 1366-8, *Fire resistance tests for service installations - Part 8: Smoke extraction ducts*

EN 1366-9, *Fire resistance tests for service installations - Part 9: Single compartment smoke extraction ducts*

EN 1366-10, *Fire resistance tests for service installations - Part 10: Smoke control dampers*

EN 12101-1:2005, *Smoke and heat control systems - Part 1: Specification for smoke barriers*

EN 12101-2, *Smoke and heat control systems - Part 2: Specification for natural smoke and heat exhaust ventilators*

EN 12101-3, *Smoke and heat control systems - Part 3: Specification for powered smoke and heat control ventilators (Fans)*

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

EN ISO 13943:2010, *Fire safety - Vocabulary (ISO 13943:2008)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 13943:2010 and the following apply.

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 can 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
product provided for test purposes

3.4
smoke control duct
duct used in a system to control the movement and/or containment of smoke and heat

3.4.1
single compartment smoke control duct
smoke control duct designed to provide a degree of fire resistance for use within single fire compartment application

3.4.2
multi compartment smoke control duct
smoke control duct designed to provide a degree of fire resistance for use in multicompartment applications

3.5
smoke control dampers
device, open or closed in its operational position to control the flow of smoke and hot gasses, which is automatically or manually activated

3.5.1
single-compartment smoke control damper
device for use within a single compartment, associated with a single compartment smoke extraction duct conforming to EN 1366-9

3.5.2
multi-compartment fire resisting smoke control damper
smoke control damper for use in multi-compartment applications, associated with a smoke extraction duct conforming to EN 1366-8

3.6
smoke barrier
device to channel, contain and/or prevent the migration of smoke (fire effluent)

Note1 to entry: Smoke barriers are also referred to as smoke curtains, smoke blinds or smoke screens.

3.7
smoke and heat exhaust ventilator
device specially designed to move smoke and hot gasses out of a construction works under conditions of fire

3.8
powered smoke and heat exhaust ventilator
powered device (usually a fan) that is suitable for exhausting hot gasses from a building under fire conditions

Note 1to entry: Such devices are often able to function under fire conditions for a limited period only.

3.9
natural smoke and heat exhaust ventilator
device specifically designed to move smoke and hot gasses out of the construction works by buoyancy forces

3.10
extended application result
predicted result for performance parameter obtained following the process of extended field of application

3.11
extended application report
document reporting extended application results, including all details of the process leading to those results, prepared in accordance with EN 15725

4 Fire scenarios

4.1 General

NOTE 1 The essential requirement ‘safety in case of fire’ of the Construction Products Regulation addresses the spread of fire and smoke in a building. To demonstrate satisfaction of this requirement, the fire resistance performance of these components is addressed in this European Standard.

Fire resistance shall be assessed using one or more of the levels of thermal attack given in 4.2 to 4.5.

NOTE 2 Later clauses of this European Standard identify which attack(s) shall be used for which products.

NOTE 3 The various levels of thermal action given in 4.2 to 4.5 reflect different fire scenarios and the standards which specify their translation into practical tests give tolerances for their application.

NOTE 4 Other heating curves exist, for example the hydrocarbon curve. Also, for extreme fire scenarios (e.g. traffic tunnels, nuclear plants), more severe conventional curves are specified. These are not, however, used for the classification of products according to this European Standard.

4.2 The standard temperature/time curve (post flash-over fire)

The 'post flash-over' fire test utilizes the 'standard temperature/time relationship' which is a model of a fully developed fire in a compartment and is given by the following relationship:

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

where

t is the time from the start of the test in minutes (min);

T is the mean furnace temperature in degrees Celsius (°C).

The post flash-over fire curve shall be applied in accordance with EN 1363-1.

When applied as a basis for testing, the relationship shall be applied for the full duration of the test.

4.3 The slow heating curve (smouldering fire)

The 'smouldering' fire test shall only used if the fire resistance performance of the product is expected to be reduced by exposure to temperatures associated with the growth stage of a fire.

NOTE It is, therefore, particularly relevant to products whose performance can be dependent upon high heating rates below approximately 500 °C (defined in the 'standard temperature/time' curve) for achievement of their classifications (i.e. mainly reactive or intumescent products).

The slow heating curve is given by the following relationship:

for $0 < t \leq 21$

$$T = 154 t^{0,25} + 20$$

for $t > 21$

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

where

t is the time from start of test, in minutes (min);

T is the mean furnace temperature in degrees Celsius (°C).

The smouldering fire curve shall be applied in accordance with EN 1363-2.

4.4 Constant temperature attack

In addition to the heating regimes given above, the evaluation of smoke barriers and smoke and heat exhaust ventilators shall be made using a notional constant temperature attack. The specified temperature and the rate at which the temperature is reached, is specified in the relevant test method.

4.5 Specific thermal actions

4.5.1 Smoke control ducts

Multicompartment ducts – standard temperature/time curve.

Single compartment ducts – a constant temperature of either 300 °C or 600 °C, following the standard temperature/time curve up to the specified constant temperature.

NOTE EN 1366-9 does not include a test for assessing integrity at 300 °C.

4.5.2 Smoke control dampers

Multi-compartment dampers – standard temperature/time curve.

Single compartment dampers – a constant temperature of either 300 °C or 600 °C, following the standard temperature/time curve up to the specified constant temperature.

NOTE EN 1366-10 does not include a test for assessing integrity at 300 °C.

4.5.3 Smoke barriers

A constant temperature of 600 °C, following the standard temperature/time curve up to the specified constant temperature.

4.5.4 Powered smoke and heat control ventilators

A constant temperature of:

200 °C, reached within 5 min to 10 min, or

300 °C, reached within 5 min to 10 min, or

400 °C, reached within 5 min to 10 min, or

600 °C, reached within 5 min to 10 min, or

842 °C following the standard temperature/time curve up to the specified constant temperature.

4.5.5 Natural smoke and heat exhaust ventilators

A constant temperature of 300 °C, increasing the furnace temperature following a gradient as specified in EN 12101-2.

A constant temperature of 600 °C, increasing the furnace temperature following a gradient as specified in EN 12101-2.

A constant temperature of θ °C, increasing the furnace temperature following a gradient as specified in EN 12101-2.

NOTE θ °C is an open class for special applications.