SLOVENSKI STANDARD
SIST EN 13501-6:2019

01-april-2019

Nadomešča:
SIST EN 13501-6:2014

Požarna klasifikacija gradbenih proizvodov in elementov stavb - 6. del: Klasifikacija po podatkih iz preskusov odziva na ogenj na električnih, krmilnih in komunikacijskih kablih

Fire classification of construction products and building elements - Part 6: Classification using data from reaction to fire tests on power, control and communication cables

Klassifizierung von Bauprodukten und Bauarten zu ihrem Brandverhalten - Teil 6: Klassifizierung mit den Ergebnissen aus den Prüfungen zum Brandverhalten von Starkstromkabeln und -leitungen, Steuer- und Kommunikationskabeln

Classement au feu des produits et éléments de construction - Partie 6: Classement à partir des données d'essais de réaction au feu sur câbles de puissance, de commande et de communication

Ta slovenski standard je istoveten z: EN 13501-6:2018

ICS:

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

SIST EN 13501-6:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13501-6

December 2018

ICS 13.220.50; 29.060.20

Supersedes EN 13501-6:2014

English Version

Fire classification of construction products and building elements - Part 6: Classification using data from reaction to fire tests on power, control and communication cables

Classement au feu des produits et éléments de construction - Partie 6: Classement à partir des données d'essais de réaction au feu sur câbles de puissance, de commande et de communication

Klassifizierung von Bauprodukten und Bauarten zu ihrem Brandverhalten - Teil 6: Klassifizierung mit den Ergebnissen aus den Prüfungen zum Brandverhalten von Starkstromkabeln und -leitungen, Steuer- und Kommunikationskabeln

This European Standard was approved by CEN on 9 November 2018.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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.

CEN members are the national standards bodies of 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword

This document (EN 13501-6:2018) 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 June 2019, and conflicting national standards shall be withdrawn at the latest by September 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13501-6:2014.

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 for electric cables falling under the Construction Product Regulation (305/2011), which contain performance requirements against reaction to fire tests, should make reference to the reaction to fire classification given in this European Standard and not refer directly to any specific fire test method.

This document has been prepared in cooperation with CLC/TC 20 “Electric cables”, CLC/TC 46X “Communication cables” and CLC/TC 86A “Optical fibre cables”.

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 roofs tests;*

— *Part 6: Classification using data from reaction to fire tests on power, control and communication 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The aim of this European Standard is to define a harmonized procedure for the classification of reaction to fire of power, control and communication cables and hybrid cables. This classification is based on the test procedures listed in Clause 5.

This European Standard has been prepared in support of the second essential requirement in the EC Construction Products Regulation (CPR) (EU) N°305/2011 and as detailed in the Interpretative Document Number 2: Safety in case of fire (OJ C62 Vol. 37).

Background information on the Commission Decision regarding the classification of the reaction to fire performance of electric cables is given in Annex B.

There is a procedure by which certain products can be assigned a particular fire classification without the need for testing. Such products have well established reaction to fire performance and have been agreed by the Standing Committee on Construction. Agreements relating to such products which may be 'classified without further testing' (CWFT) are published in the Official Journal of the EC.

Part 1 of this European Standard covers classification resulting from reaction to fire tests for products other than electric cables.

Parts 2, 3 and 4 of this European Standard are concerned with classification resulting from fire resistance tests.

Part 5 covers classification resulting from tests for external fire exposure to roofs.

1 Scope

This document provides the reaction to fire classification procedure for electric cables.

NOTE For the purpose of this document, the term “electric cables” covers all power, control and communication cables, including optical fibre cables.

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 50399, *Common test methods for cables under fire conditions - Heat release and smoke production measurement on cables during flame spread test - Test apparatus, procedures, results*

EN 50575, *Power, control and communication cables - Cables for general applications in construction works subject to reaction to fire requirements*

CLC/TS 50576, *Electric cables - Extended application of test results for reaction to fire*

EN 60332-1-2:2004, *Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame (IEC 60332-1-2:2004)*

EN 60754-2, *Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity (IEC 60754-2)*

EN 61034-2, *Measurement of smoke density of cables burning under defined conditions - Part 2: Test procedure and requirements (IEC 61034-2)*

EN ISO 1716, *Reaction to fire tests for products - Determination of the gross heat of combustion (calorific value) (ISO 1716)*

3 Terms, definitions and symbols

3.1 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

3.1.1
product
material, element or component about which information is required, in the context of this standard, the product is an electric cable about which information is required

3.1.2
material
single basic substance or uniformly dispersed mixture of substances

3.1.3
external component
external layer of the cable, i.e. the sheath

3.1.4
end use application
real application of a product, in relation to all aspects that influence the behaviour of that product under different fire situations

Note 1 to entry: It covers aspects such as its quantity, orientation, position in relation to other adjacent products, and its method of fixing.

3.1.5
fire performance
response of a material, product or assembly in a fire

Note 1 to entry: It is often important to understand how materials, products or assemblies behave in real fires as opposed to in fire tests under controlled conditions. Improved fire performance can be exhibited in a variety of ways. For example, longer times to ignition, lower heat release, lower flame spread or lower smoke release could all be evidence of improvements in fire performance.

Note 2 to entry: Compare with the term fire behaviour.

[SOURCE: EN ISO 13943:2017, 3.137]

3.1.6
reaction to fire
response of a test specimen when it is exposed to fire under specified conditions in a fire test

[SOURCE: EN ISO 13943:2017, 3.324]

3.1.7
fire scenario
qualitative description of the course of a fire with respect to time, identifying key events that characterize the studied fire and differentiate it from other possible fires

Note 1 to entry: See fire scenario cluster and representative fire scenario.

Note 2 to entry: It typically defines the ignition and fire growth processes, the fully developed fire stage, the fire decay stage, and the environment and systems that will impact on the course of the fire.

Note 3 to entry: Unlike deterministic fire analysis, where fire scenarios are individually selected and used as design fire scenario, in fire risk assessment, fire scenarios are used as representative fire scenarios within fire scenario clusters.

[SOURCE: EN ISO 13943:2017, 3.152]

3.1.8
reference scenario
hazard situation used as a reference for a given test method or classification system

3.1.9
fire situation
stage in the development of a fire, characterised by the nature, severity and size of the thermal attack on the products involved

3.1.10
combustion
exothermic reaction of a substance with an oxidizing agent

Note 1 to entry: Combustion generally emits fire effluent accompanied by flames and/or glowing.

[SOURCE: EN ISO 13943:2017, 3.55]

3.1.11
heat of combustion
thermal energy produced by combustion of unit of mass of a given substance

[SOURCE: EN ISO 13943:2017, 3.203]

Note 1 to entry: It is expressed in kilojoules per gram.

3.1.12
gross heat of combustion (PCS)
heat of combustion of a substance when the combustion is complete and any produced water is entirely condensed under specified conditions

[SOURCE: EN ISO 13943:2017, 3.198]

3.1.13
net heat of combustion (PCI)
heat of combustion when any water produced is considered to be in the gaseous form .

Note 1 to entry: The net heat of combustion is always smaller than the gross heat of combustion because the heat released by the condensation of water vapour is not included.

Note 2 to entry: The typical unit is $kJ \cdot g^{-1}$.

[SOURCE: EN ISO 13943:2017, 3.280]

3.1.14
contribution to fire
energy released by a product influencing the fire growth both in pre- and post-flashover situations

3.1.15
heat release
thermal energy produced by combustion

Note 1 to entry: The typical unit is J.

[SOURCE: EN ISO 13943:2017, 3.205]

3.1.16
vertical flame spread (FS)
damaged length of the sample, as measured in the EN 50399 test

3.1.17
vertical flame spread (H)
distance from the upper onset of charring (above the flame application point) to the lower onset of charring (below the flame application point) as measured in the EN 60332-1-2 test

3.1.18
fully developed fire
state of total involvement of combustible materials in a fire

[SOURCE: EN ISO 13943:2017, 3.192]

3.1.19
flashover
transition to a state of total surface involvement in a fire of combustible materials within an enclosure

[SOURCE: EN ISO 13943:2017, 3.184]

3.1.20
flaming droplets/particles
material separating from the specimen during the fire test and continuing to flame for a minimum period as described by the test method

[SOURCE: EN 50399:2011, 3.7]

3.1.21
FIGRA
fire growth rate index used for classification purposes for the classes $B1_{ca}$, $B2_{ca}$, C_{ca} and D_{ca}

Note 1 to entry: For the classification of cables, FIGRA means the maximum of the quotient of heat release rate from the specimen, excluding the contribution of ignition source, and the time of its occurrence using a THR threshold of 0,4 MJ and an HRR threshold of 3 kW.

Note 2 to entry: The *FIGRA* for cables is defined in more detail in EN 50399.

3.1.22
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

3.1.23
extended field of application
outcome of a process (involving the application of defined rules that may incorporate calculation procedures) that, in the context of this standard, attributes for a cable family, a test result on the basis of one or more test results to the same test standard

3.1.24
extended application result
predicted result for performance parameter obtained following the process of extended field of application

3.1.25
extended application report
document reporting extended application results, including all details of the process leading to those results

3.2 Symbols and abbreviations

The symbols and notations correspond to those given in the appropriate test method.

NOTE If different, the definition of symbol in the delegated Regulation (EU) 2016/364 of 1st July 2015 is given between brackets.

FIGRA	fire growth rate index used for classification purposes [W/s] (Fire growth rate)
PCS	gross heat of combustion [MJ/kg] (Gross calorific potential)
THR_{1200s}	total heat release (HRR_{sm30}) from test start until end of test, excluding contribution from ignition source [MJ]
TSP_{1200s}	total smoke production (SPR_{sm60}) from test start until end of test [m^2]
Peak HRR	= HRR = maximum value of heat release, excluding the burner output, determined during the whole burner application time, averaged over 30 s expressed in [kW] (Maximum of HRRsm30 between test start and end of test excluded contribution from ignition source)
Peak SPR	= SPR = maximum value of smoke production, determined during the whole burner application time, averaged over 60 s, expressed in [m^2/s] (maximum SPR sm60 between test start and end of test)
FS	vertical flame spread [m] equals the damaged length of the sample
H	vertical flame spread [mm] as defined in 3.1.17
m'	mean value of the set of results of a continuous parameter determined in accordance with the relevant test method using the minimum number of tests as specified in the test method
m	mean value of the set of results of a continuous parameter determined in accordance with the procedure in 7.4 and used for classification

4 Classes of reaction to fire performance

The classes with their corresponding fire performance are given in Table 1.

Products classified in a given class are deemed to satisfy all the requirements of any lower class.

The main classification can only be obtained by undertaking the tests for a particular product or product family. Some additional classification can be obtained without testing (e.g. a3).

5 Test methods

5.1 General

The following test methods are specified in relation to the envisaged reaction to fire classification. The relevant classification parameters are given in Table 1.