SLOVENSKI STANDARD
SIST EN 13501-5:2016

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Nadomešča:
SIST EN 13501-5:2006+A1:2009

Požarna klasifikacija gradbenih proizvodov in elementov stavb - 5. del: Klasifikacija na podlagi podatkov iz preskusov požarne odpornosti streh z zunanje strani

Fire classification of construction products and building elements - Part 5: Classification using data from external fire exposure to roofs tests

Klassifizierung von Bauprodukten und Bauarten zu ihrem Brandverhalten - Teil 5: Klassifizierung mit den Ergebnissen aus Prüfungen von Bedachungen bei Beanspruchung durch Feuer von außen

Classement au feu des produits et éléments de construction - Partie 5: Classement utilisant des données d'essais au feu des toitures exposées à un feu extérieur

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ICS:

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

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EUROPEAN STANDARD

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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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European foreword

This document (EN 13501-5:2016) 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 13501-5:2005+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of an identical text or by endorsement, at the latest by December 2016, and conflicting national standards shall be withdrawn at the latest by December 2016.

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 European Standard 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 external fire exposure of roofs should make reference to the 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 components of normal 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

The aim of this European Standard is to define a harmonized procedure for the classification of roofs/roof coverings exposed to external fire. This classification is based on the test methods listed in Clause 5 and the relevant field of application procedures.

This European Standard has been prepared in support of the second essential requirement in the European Commission (EC) Construction Products Regulation (No 305/2011) and as detailed in the Interpretative document number 2: Safety in case of fire (OJ C62 Vol. 37).

The EC has drawn up a list of products which under specified conditions, may be considered to be Class B_{ROOF} without testing. This information is given in the Commission Decision of 2000-09-06 establishing the list of products belonging to Classes B_{ROOF} (Decision 2000/553/EC – 2005/403/EC – 2006/600/EC).

Additionally 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 reactions 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 EU.

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

1 Scope

This European Standard provides the fire performance classification procedures for roofs/roof coverings exposed to external fire based on the four test methods given in CEN/TS 1187:2012 and the relevant extended application rules.

For the classification of a roof/roof covering, only those test methods and those application rules need to be applied for which the corresponding classification is envisaged.

Products are considered in relation to their end use application.

NOTE The distinction between roofs with a steep slope and facades, in terms of the test and classification standard to be applied, may be subject to national regulations.

General information on the four test methods in CEN/TS 1187 is given in Annex A.

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.

CEN/TS 1187:2012, *Test methods for external fire exposure to roofs*

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

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 CEN/TS 1187:2012 and the following apply.

3.1
external fire spread time
T_E
time for external fire spread to the edge of the measuring zone (for test 3)

3.2
time to fire penetration
T_p
time for fire penetration as defined in 3. 5

3.3
non-combustible substrate or deck
substrate or deck classified A1 or A2-s1,d0 according to EN 13501-1 (for the purpose of this European Standard only)

3.4
combustible substrate or deck
substrate or deck not satisfying the definition of 'non-combustible product' in 3.3

3.5
penetration by fire
appearance on the underside of the specimen of any flaming or glowing other than that of the test flame, disregarding any test flame appearing through pre-existing openings in the test specimen (for test 4)

3.6
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

3.7
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

3.8
extended application result
predicted result for performance parameter obtained following the process of extended field of application

3.9
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 Classes of external fire performance of roofs/roof coverings

The classification set out in this European Standard is based upon the test methods contained in CEN/TS 1187. That standard incorporates four distinct test methods that correspond to different fire hazard scenarios. There is no direct correlation between the test methods and hence no generally acceptable hierarchy of classification between them.

Products classified in a given class are deemed to satisfy all the requirements of any lower class for the same test method/fire hazard scenario. The classes with their corresponding fire performance are given in Table 1.

5 Test methods

5.1 General

The four test methods given in CEN/TS 1187 are those to be used for classification purposes for roofs/roof coverings. The selection of the tests to be carried out is specified in 6.3. The classification parameters, the classes and the corresponding criteria are specified in Clauses 8 and 9.

5.2 Test 1: Method with burning brands

The test evaluates the performance of a roof under the conditions of thermal attack with burning brands. The performance includes the fire spread across the external surface of the roof, the fire spread within the roof and the fire penetration.

5.3 Test 2: Method with burning brands and wind

The test evaluates the performance of a roof covering under the conditions of thermal attack with burning brands and additional wind. The performance includes damaged length both on the roof covering and in the substrate.

5.4 Test 3: Method with burning brands, wind and supplementary radiant heat

The test evaluates the performance of a roof under the conditions of thermal attack with burning brands, additional wind and radiant heat. The performance includes the external fire spread and the fire penetration.

5.5 Test 4: Two-stage method incorporating burning brands, wind and supplementary radiant heat

The test evaluates the performance of a roof under the conditions of thermal attack with burning brands, wind and radiant heat. The performance includes the external fire spread and the penetration by fire.

6 Principles for specimen preparation, testing and classification

6.1 General requirements for specimen preparation

In general, this paragraph covers tests 1, 3 and 4.

Before testing, the test specimens shall be prepared and conditioned and, where relevant, mounted in accordance with the relevant test method and product standards or other technical specifications.

The external fire performance of a roof/roof covering includes such aspects as external and internal fire spread, external and internal damage, fire penetration and the occurrence of flaming droplets or debris. The external fire performance of a roof/roof covering therefore does not only depend on the burning behaviour of the exposed surface, the roof covering, but also on the influences of several components of the roof, such as the nature and thickness of insulating layers and vapour barriers together with their supporting elements. It may also depend on the systems of attachment of all components, e.g. glued or mechanically fastened.

Therefore, the test specimens shall be representative, in all details of practical application with regard to:

a) substrate and deck;

b) type, the number and the joining of all layers of roofing materials (including any insulation, vapour barriers, etc.); and

c) fixing of the layers.

In order to reduce the amount of testing, individual test methods specify standard specimen arrangements, covering a wider field of application.

Such standard specifications concern the supporting decks and substrates, and the types and positioning of joints.

6.2 General requirements for testing

The external fire performance of a roof/roof covering does not only depend on the intrinsic properties of its components and the fire attack conditions, but also to a large extent on the pitch of the roof.

In order to reduce the amount of testing, some standard pitches are defined, covering a wider field of application. However, in tests 1 and 3 a sponsor may choose none of the standard pitches, although this will limit the field of application of the classification to the pitch used for testing.

6.3 Selection of test methods

Four different test methods, representing four different scenarios, are specified in CEN/TS 1187. The methods assess the fire performance of roofs/roof coverings under the following conditions:

a) Test 1 assesses the performance of a roof under attack with burning brands;

b) Test 2 assesses the performance of a roof covering under attack with burning brands and wind;

c) Test 3 assesses the performance of a roof under attack with burning brands, wind and supplementary radiant heat;

d) Test 4 assesses the performance of a roof using a two stage test method incorporating burning brands, wind and supplementary radiant heat.

The choice of the test method(s) to be applied depends on the classification envisaged by the sponsor.

If only a classification B_{ROOF} (t1) is envisaged (see Table 1), only test 1 with burning brands is carried out.

If only a classification B_{ROOF} (t2) is envisaged (see Table 1), only test 2 with burning brands and wind is carried out.

If only a classification B_{ROOF} (t3) or C_{ROOF} (t3) or D_{ROOF} (t3) is envisaged (see Table 1), only test 3 with burning brands, wind and supplementary radiant heat is carried out.

If only a classification B_{ROOF}(t4) or C_{ROOF}(t4) or D_{ROOF}(t4) or E_{ROOF}(t4) is envisaged (see Table 1), only test 4: two stage test method incorporating burning brands, wind and supplementary radiant heat is carried out.

If more than one classification is required, all the corresponding tests are carried out, as there is no direct correlation between the test methods and hence, no generally accepted hierarchy of classification between them.

6.4 Field of application

The field of application can be specified using test reports and other relevant data, in accordance with the procedures specified in EN 15725, which describe the role of extended application in the classification process.

6.5 Specific requirements

6.5.1 General

Each test specifies a series of standard specimen compositions and test conditions covering a wider field of direct application.

The number of specimens to be prepared as well as the number of tests to be carried out depends on the envisaged field of application of the classification.

Variables are the pitch of the roof, the deck and/or substrate applied for the test and the inclusion of joints.

6.5.2 Test 1

6.5.2.1 General

Tests to be carried out are chosen to cover the envisaged field of application. The field of direct application is specified in 6.5.2.5. The extended field of application is specified in the relevant extended application standard and in EN 15725.

6.5.2.2 Pitch

The standard test pitches are 15° and 45°. Tests may also be done at the actual intended pitch.

6.5.2.3 Nature of the deck

The standard supporting decks for tests are specified in CEN/TS 1187:

a) wood particle board deck, constructed from planks 250 mm wide × 16 mm thick, density (680 ± 50) kg/m^3 with plain edges and tightly but jointed so that gaps between planks do not exceed 0,5 mm;

b) deck from wood particle board planks as under a) with plain edges with gaps of (5,0 ± 0,5) mm;

c) deck of 10 mm thick reinforced calcium silicate board, dry density (680 ± 50) kg/m^3;

d) trapezoidal profiled steel deck;

e) without any continuous deck.

Tests may also be done with the actual intended deck. The classification so obtained is valid only for the deck tested.

Table B.1 indicates how the deck can be selected taking into account the envisaged field of application.

For each type of deck for which a classification is required, four test specimens are tested out of five types specified in 6.5.2.4 as shown in CEN/TS 1187:2012, Table 1.

6.5.2.4 Positioning of joints

To assess the influence of the joints on the performance of the roof, five standard specimen types are defined out of which four shall be tested, details of which are given in CEN/TS 1187.

For every test on a given roof, four specimens are tested.