

**SLOVENSKI STANDARD**  
**SIST EN 13501-5:2006+A1:2009**  
**01-december-2009**

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**Požarna klasifikacija gradbenih proizvodov in elementov stavb - 5. del:  
Klasifikacija na podlagi podatkov iz preskusov pri izpostavljenosti streh požaru 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

**Ta slovenski standard je istoveten z: EN 13501-5:2005+A1:2009**

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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
<b>SIST EN 13501-5:2006+A1:2009</b>		<b>en,fr,de</b>

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

Classement au feu des produits et éléments de  
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Beanspruchung durch Feuer von außen

This European Standard was approved by CEN on 22 September 2005 and includes Corrigendum 1 issued by CEN on 10 September 2008 and Amendment 1 approved by CEN on 17 July 2009.

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## Foreword

This document (EN 13501-5:2005+A1:2009) 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of an identical text or by endorsement, at the latest by March 2010, and conflicting national standards shall be withdrawn at the latest by March 2010.

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 includes Amendment 1, approved by CEN on 2009-07-17 and Corrigendum 1, issued by CEN on 2008-09-10.

This document supersedes EN 13501-5:2005.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\boxed{A_1}$   $\boxed{A_1}$ .

The modifications of the related CEN Corrigendum have been implemented at the appropriate places in the text and are indicated by the tags  $\boxed{AC}$   $\boxed{AC}$ .

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the Construction Products Directive.

$\boxed{A_1}$  Amendment 1 provides for the use of extended application reports in the classification procedure.  $\boxed{A_1}$

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 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.

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 United Kingdom.

**EN 13501-5:2005+A1:2009 (E)****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 <sup>A1</sup> Clause 5 and the relevant field of application procedures <sup>A1</sup>.

This European Standard has been prepared in support of the second essential requirement in the EC Construction Products Directive (89/106/EEC) and as detailed in the Interpretative Document Number 2: Safety in case of fire (OJ C62 Vol. 37).

The European Commission has drawn up a list of products which, under specified conditions, may be considered to be Class B<sub>ROOF</sub> without testing. This information is given in the Commission Decision of 2000-09-06 establishing the list of products belonging to Classes B<sub>ROOF</sub> (Decision 2000/553/EC).

<sup>A1</sup> NOTE Test reports constitute the basis for extended application reports as explained in prEN 15725. <sup>A1</sup>

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## 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 <sup>[A1]</sup> ENV 1187:2002 and the relevant extended application rules <sup>[A1]</sup>.

For the classification of a roof/roof covering, <sup>[A1]</sup> only those test methods and those application rules need to be <sup>[A1]</sup> 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 ENV 1187:2002 is given in Annex A.

## 2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ENV 1187:2002, *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*

<sup>[A1]</sup> prEN 15725, *Extended application reports on the fire performance of construction products and building elements* <sup>[A1]</sup> <https://standards.iteh.ai/catalog/standards/sist/8d101c3b-8a1c-40b4-8f73-062bd37bf8a0/sist-en-13501-5-2006a1-2009>

EN ISO 13943:2000, *Fire safety — Vocabulary (ISO 13943:2000)*

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 13943:2000 and the following apply.

### 3.1

#### roof

covering and sealing system, including any insulating layers or vapour barriers normally provided together with their supporting elements including attachment (glued, mechanically fastened etc.), and roof lights or other closures for roof apertures that are intended to provide a weatherproof surface

[ENV 1187:2002]

### 3.2

#### material

basic single substance or uniformly dispersed mixture of substances (e.g. metal, stone, wood, bitumen, concrete, mineral wool)

[ENV 1187:2002]

**EN 13501-5:2005+A1:2009 (E)****3.3****damaged material**

material that has been burnt, charred, melted or otherwise visually changed by heat. Discolouration and soot deposits are not to be regarded as damaged material

[ENV 1187:2002]

**3.4****burnt material**

material that has been destroyed by combustion or pyrolysis

[ENV 1187:2002]

**3.5****composite**

combination of materials which is generally recognized in building construction as a discrete entity (e.g. coated or laminated products such as roofing felts)

[ENV 1187:2002]

**3.6****assembly**

fabrication of materials and/or composites (e.g. sandwich panels)

[ENV 1187:2002]

**3.7****product**

material, composite or assembly about which information is required

[ENV 1187:2002]

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**3.8****specimen**

representative section of the roof/roof covering prepared for the purpose of the test

[ENV 1187:2002]

**3.9****continuous deck**

element with a continuous supporting function in which the AC *deleted text* AC gap between adjacent elements is not greater than 0,5 mm (5,0 ± 0,5 mm in the case of wooden planks with plain edges) (for test 1 and test 3)

[ENV 1187:2002]

**3.10****exposed surface**

external surface of the specimen which is subject to the heating conditions of the test

[ENV 1187:2002]

**3.11****measuring zone**

area of the specimen within which measurements are made

[ENV 1187:2002]



**3.12****underside**

bottom surface of the specimen

[ENV 1187:2002]

**3.13****sustained flaming**

flames arising from an observed location, which persist for 5 s or longer

[ENV 1187:2002]

**3.14****external fire spread**

progression and extent of sustained flaming across the exposed surface of the specimen

[ENV 1187:2002]

**3.15****fire penetration**

appearance on the underside of the specimen of any sustained flaming or glowing due to combustion, including the occurrence of any flaming droplets falling from the underside. Charring and/or discolouration are not to be regarded as fire penetration (for tests 1 and 3)

[ENV 1187:2002]

**3.16****opening**

appearance during the test of any hole greater than 25 mm<sup>2</sup> in area or any crack greater than 2 mm wide, which penetrates completely through the specimen and which would allow burning materials to fall through the roof (for tests 1 and 3)

[ENV 1187:2002]

**3.17****internal damage**

extent of damaged material in each layer inside the specimen, measured from the edges of the projection of the ignition source in the upwards and downwards directions with respect to the pitch of the roof (for tests 1 and 3)

[ENV 1187:2002]

**3.18****fire spread within the roof/internal fire spread**

maximum burnt length measured from the upper edge of the projection of the ignition source in the upward direction and from the lower edge in the downward direction of each layer for sloped roofs, and in any direction for horizontal roofs (pitch of 0°) (for tests 1 and 3)

[ENV 1187:2002]

**3.19****flaming droplets or debris**

burning material falling from the specimen that continues to burn on the floor for at least 5 s

[ENV 1187:2002]

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**EN 13501-5:2005+A1:2009 (E)****3.20****joint**

any kind of connection or link within a layer in the roof, such as an overlap or seam

[ENV 1187:2002]

**3.21****roof covering**

uppermost layer of a roof. This layer can comprise single layer or multiple layer coverings

[ENV 1187:2002]

**3.22****damaged length**

length of damaged material of the roof covering and of the substrate respectively, expressed in mm as measured from the centre of the wood crib position (for test 2)

[ENV 1187:2002]

**3.23****substrate**

product which is used immediately beneath the roof covering about which information is required (for test 2)

[ENV 1187:2002]

**3.24****roof pitch**

inclination of the roof surface to the horizontal

[ENV 1187:2002]

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**3.25****external fire spread time (T<sub>E</sub>)**

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

**3.26****time to fire penetration (T<sub>p</sub>)**

time for fire penetration as defined in 3.15

**3.27****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)

**3.28****combustible substrate or deck**

substrate or deck not satisfying the definition of 'non-combustible substrate or deck' in 3.27

**3.29****penetration by fire**

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

**Annex A****3.30****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

**3.31****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

**3.32****extended application result**

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

**3.33****extended application report**

document reporting extended application results, including all details of the process leading to those results, prepared in accordance with prEN 15725 <sup>(A1)</sup>

**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 ENV 1187:2002. 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.

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**5 Test methods**

[SIST EN 13501-5:2006+A1:2009](https://standards.iteh.ai/catalog/standards/sist/8d101c3b-8a1c-40b4-8f73-062bd37bf8a0/sist-en-13501-5-2006a1-2009)

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**5.1 General**

The four test methods given in ENV 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.

**EN 13501-5:2005+A1:2009 (E)****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**

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:

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- a) substrate and deck;
  - b) type, the number and the joining of all layers of roofing materials (including any insulation, vapour barriers, etc.); <https://standards.iteh.ai/catalog/standards/sist/8d101c3b-8a1c-40b4-8f73-062bd37bf8a0/sist-en-13501-5-2006a1-2009>
  - 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 e.g. 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 ENV 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;