SLOVENSKI STANDARD
oSIST prEN 13823:2019

01-februar-2019

Preskusi odziva gradbenih proizvodov na ogenj - Gradbeni proizvodi razen talnih oblog, izpostavljeni toplotnemu delovanju enega samega gorečega predmeta

Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item

Prüfungen zum Brandverhalten von Bauprodukten - Thermische Beanspruchung durch einen einzelnen brennenden Gegenstand für Bauprodukte mit Ausnahme von Bodenbelägen

Essais de réaction au feu des produits de construction - Produits de construction à l'exclusion des revêtements de sol exposés à une sollicitation thermique provoquée par un objet isolé en feu

Ta slovenski standard je istoveten z: prEN 13823

ICS:

13.220.50	Požarna odpornost gradbenih materialov in elementov	Fire-resistance of building materials and elements
91.060.01	Stavbni elementi na splošno	Elements of buildings in general
91.100.01	Gradbeni materiali na splošno	Construction materials in general

oSIST prEN 13823:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 13823

December 2018

ICS 13.220.50; 91.060.01; 91.100.01

Will supersede EN 13823:2010+A1:2014

English Version

Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item

Essais de réaction au feu des produits de construction - Produits de construction à l'exclusion des revêtements de sol exposés à une sollicitation thermique provoquée par un objet isolé en feu

Prüfungen zum Brandverhalten von Bauprodukten - Thermische Beanspruchung durch einen einzelnen brennenden Gegenstand für Bauprodukte mit Ausnahme von Bodenbelägen

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.

This draft European Standard was established by CEN 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.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

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

Ref. No. prEN 13823:2018 E

Contents

Page

European foreword

This document (prEN 13823:2018) has been prepared by Technical Committee CEN/TC 127 “Fire safety in buildings”, the secretariat of which is held by BSI.

This document will supersede EN 13823:2010+A1:2014.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

Introduction

The classification of the reaction to fire performance of construction products established by EC Decision 2000/147/EC (OJEU L50 of 23.2.2000) defines in Table 1 the reaction to fire classes for building products excluding floorings. The relevant test methods for determining the reaction to fire are being prepared by CEN/TC 127.

Safety warning

The attention of all persons concerned with managing and carrying out the tests described in this standard is drawn to the fact that fire testing can be hazardous and that toxic and/or harmful smoke and gases can be produced during the test.

An assessment of all potential hazards and risks to health should be made and safety precautions should be identified and provided. Smoke and gases should be removed from the workplace. Written safety instructions should be issued. Appropriate training should be given to relevant personnel. Laboratory personnel should ensure that they follow written safety instructions at all times.

Special precautions are required for the propane gas supply system.

— The equipment, for example tubes, couplings, flow meters, should be approved for propane.

— The burner should be equipped with a remote-controlled ignition device, for example a pilot flame or a glow wire. There should be a warning system for leaking gas and a valve for immediate and automatic cut-off of the gas supply in case of extinction of the ignition flame. The pilot flames can be ignited directly by an operator in the test room, however, no one should be present in the test room during ignition of a burner.

— It should be possible to operate the switch between auxiliary and main (primary) burner and the preceding main valve (to open or stop the propane supply) from outside the test room.

Special precautions are required for the extinction of burning specimens.

When the extinction is carried out because of intensive combustion of the specimens, it is recommended that a second operator is ready to intervene. Means for extinguishing should be available (e.g. since the heat output during intensive combustion can damage the apparatus).

1 Scope

This document specifies a method of test for determining the reaction to fire performance of construction products excluding floorings, and excluding products which are indicated in Table 1 of EC Decision 2000/147/EC, when exposed to thermal attack by a single burning item (SBI). The calculation procedures are given in Annex A. Information on the precision of the test method is given in Annex B. The calibration procedures are given in Annexes C and D, of which Annex C is a normative annex.

NOTE This document has been developed to determine the reaction to fire performance of essentially flat products. The treatment of some families of products, e.g. linear products (pipes, ducts, cables etc.), can need special rules.

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 13238, *Reaction to fire tests for building products - Conditioning procedures and general rules for selection of substrates*

EN 13501-1:2007+A1:2009, *Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests*

EN 60584-1:2013, *Thermocouples — Part 1: Reference tables (IEC 60584-1:2013)*

EN ISO 13943:2017, *Fire safety — Vocabulary (ISO 13943:2017)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 13943:2017 and EN 13501-1:2007+A1:2009 and the following 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
backing board
calcium silicate panel used to back the specimen that can be placed directly against a free-standing test specimen or at a distance from it

3.2
specimen
piece of a product, which is to be tested

Note 1 to entry: This can include the mounting technique used in its end-use application. This also can include an air gap and/or a substrate where appropriate.

3.3
substrate
product which is used immediately beneath the product about which information is required

3.4
***THR*$_{600s}$**
total heat release from the specimen in the first 600 s of exposure to the main (primary) burner flames

3.5
LFS
lateral flame spread on the long specimen wing

Note 1 to entry: The *LFS* is defined in more detail in 8.3.3.

3.6
***TSP*$_{600s}$**
total smoke production from the specimen in the first 600 s of exposure to the main (primary) burner flames

3.7
***FIGRA*$_{0,2\ MJ}$**
maximum of the quotient of heat release rate from the specimen and the time of its occurrence using a *THR*-threshold of 0,2 MJ

Note 1 to entry: The *FIGRA*$_{0,2\ MJ}$ is described in more detail in A.5.3.

3.8
***FIGRA*$_{0,4\ MJ}$**
maximum of the quotient of heat release rate from the specimen and the time of its occurrence using a *THR* threshold of 0,4 MJ

Note 1 to entry: The *FIGRA*$_{0,4\ MJ}$ is described in more detail in A.5.3.

3.9
SMOGRA
smoke growth rate
maximum of the quotient of smoke production rate from the specimen and the time of its occurrence

Note 1 to entry: The *SMOGRA* is described in more detail in A.6.3.

3.10
sustained flaming
persistence of flame on or over a surface for a minimum period of time

[EN ISO 13943:2017]

4 Test facility

4.1 General

The SBI test facility shall consist of a test room, the test apparatus (trolley, frame, burners, hood, collector and ducting), the smoke exhaust system and general measuring equipment. These components are specified in 4.2 to 4.7. Design drawings are given in Annex E. Dimensions given in the drawings are nominal unless tolerances are given in the text.

The air supply to the test room entering below the trolley should be fresh, uncontaminated air.

4.2 Test room

4.2.1 The test room shall have an inner height of (2,4 ± 0,05) m and an inner floor area of (3,0 ± 0,05) m in both directions. The walls shall be made of stone type building blocks (e.g. cellular concrete), gypsum boards, calcium silicate boards or other boards classified as class A1 or A2.

4.2.2 One wall of the test room shall have an opening to insert the trolley from the surrounding laboratory into the test room. The opening shall be at least 1 470 mm wide and 2 450 mm high (dimensions of the frame). Windows shall be placed in the two walls facing the front side of the two perpendicular specimen planes. To be able to handle the SBI apparatus and the specimen when the trolley is in place, an additional door is needed.

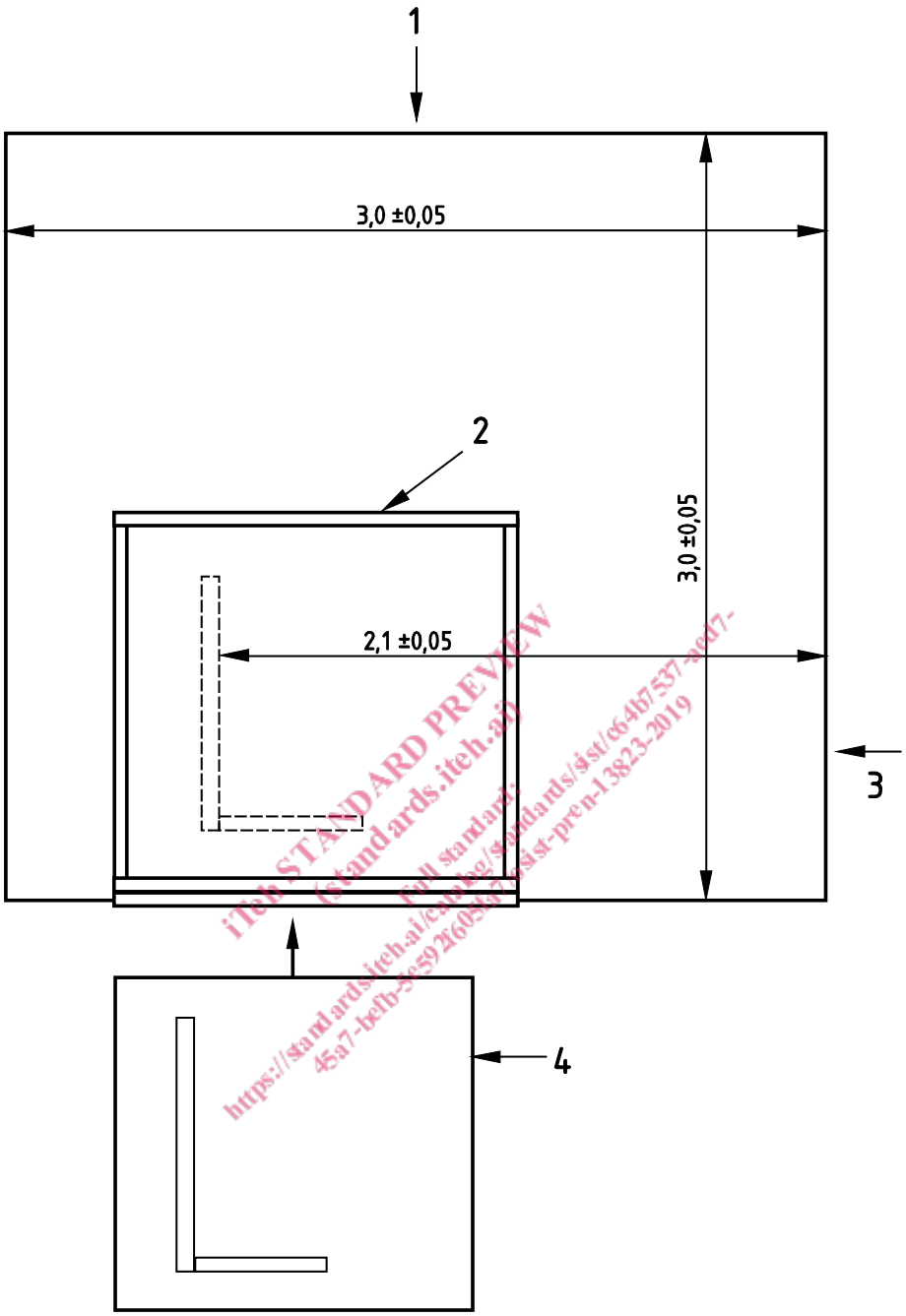
4.2.3 With the trolley in place in the test room, the distance between the long wing specimen surface touching the U-profile and the wall of the test room shall be (2,1 ± 0,05) m. This distance shall be measured perpendicularly to the wall facing the long wing. The areas of the openings in the test room, excluding the air inlet at the bottom of the trolley and the smoke exhaust opening in the hood, shall not exceed a total of 0,05 m².

4.2.4 Both left-orientated arrangements, as shown in Figure 1, and right-orientated arrangements (the trolley shown in Figure 1 mirrored around a vertical line) are allowed.

To be able to remove side plates of the hood without removing the collector, attention should be paid to the connection between the frame of the SBI apparatus and the ceiling of the room. It should be possible to move the side plate outwards at the bottom.

NOTE The relative position of the frame in the test room depends on the details of the connection between room and frame.

Dimensions in metres



Key

1 visual observation

2 fixed frame

3 visual observation (left orientated specimen)

4 trolley (with left orientated specimen)

NOTE Both left orientated and right oriented specimens are acceptable. For right orientated specimens the figure is mirrored around a vertical line.

Figure 1 — Top view of the SBI test room design (schematic drawing)

4.3 Materials

4.3.1 Commercial propane, of minimum purity 95 %.

4.4 Test apparatus

NOTE See Figures E.1 to E.35.

4.4.1 Trolley, on which two perpendicular specimen parts are placed, with a sandbox burner at the bottom of the vertical corner.

The trolley is put in place with its back side closing the opening in the wall of the test room; the air inlet under the floor of the trolley is provided with perforated plates (open area to total area 40 % to 60 %; perforation diameter 8 mm to 12 mm) to produce an evenly distributed flow along the floor of the test room.

Using a spirit level placed in the gully, periodically check the level of the L profile (behind the burner) and the C profile (in front of the specimen) to ensure they are horizontal. This will ensure that any material which melts and flows from the specimen will remain in the gulley during the test.

In addition, periodically measure the level of the platform in front of the burner to ensure this is also horizontal.

4.4.2 Fixed frame, in which the trolley is pushed and which supports the hood; a second burner is fixed to the frame.

4.4.3 Hood, on top of the frame, which collects the combustion gases.

4.4.4 Collector, on top of the hood with baffles and a horizontal outlet for the exhaust duct.

4.4.5 Exhaust duct, circular tube of inner diameter (315 ± 5) mm, and insulated with 50 mm high temperature resistant mineral wool, with the following parts (in flow direction):

— connection to the collector with an optional J-shaped bend;

— ducting, of length 1 625 mm with guide vanes and an orifice; guide vane length 630 mm closest to the collector at a minimum distance of 50 mm; directly behind the guide vanes a (2,0 ± 0,5) mm thick circular orifice with inner opening diameter 265 mm and an outer diameter of 314 mm;

— ducting, of length 2 155 mm with mountings for pressure-probe, four thermocouples, gas-sampling probe and white light extinction system; this section is called the “general measurement section”;

— ducting, of length 500 mm;

— connection to exhaust.

Attention should be paid to the fixing of the measuring duct. The total mass excluding probes, etc. is about 250 kg.

4.4.6 Two identical sandbox burners (see Figure E.9), one in the bottom plate of the trolley (the “main (primary) burner”), one fixed to a post of the frame (the “auxiliary (secondary) burner”), with the following specifications:

a) Shape: right angled triangle (top view) with two equal sides of 250 mm, height 80 mm, bottom closed except for a 12,5 mm pipe socket at the gravitational centre, top open. A right-angled triangular perforated plate shall be positioned in the burner at a height of 10 mm above the bottom. Metal gauze with a maximum mesh size of 2 mm shall be positioned at heights of 12 mm and 60 mm above the bottom. All dimensions shall be within ± 2 mm.

b) Material: box made of 1,5 mm stainless steel, filled from bottom to top with, successively, a 10 mm void, a layer of pebbles within a size distribution of 4 mm to 8 mm up to a height of 60 mm, and a top layer of sand within a size distribution of 2 mm to 4 mm up to a height of 80 mm. The metal gauze is used to stabilize the two layers and prevent the pebbles from entering the gas pipe socket. The pebbles and sand used shall be rounded (river) stones, not broken ones.

c) Position of main (primary) burner: mounted in the tray (see Figures E.9 and E.19) and connected to the U-profile at the bottom of the specimen position. The top edge of the main (primary) burner shall be (25 ± 2) mm above the top edge of the U-profile.

d) Position of auxiliary (secondary) burner: fixed to the post of the frame opposite to the specimen corner, with the top of the burner at a height of (1 450 ± 5) mm from the floor of the test room (1 000 mm vertical distance to the hood), its diagonal parallel and nearest to the hypotenuse of the main (primary) burner.

e) The main (primary) burner is connected to U-profiles at the long and the short wing specimen position (see Figure E.18, part 10). In both U-profiles a blanking plate (see Figure E.19) is placed with its top at the same height as the top of the U-profile and at 0,3 m from the corner line between the mounted specimen wings (at the border of the burner zone, see 8.3.4).

f) The main (primary) burner shall be protected with a tilted triangular grid when previous tests on the same type of product have led to an early termination to the test due to fallen material on the sand-bed in accordance with 8.5. The grid shall have a ratio of open area to total area of at least 90 %. One side of the grid shall be placed on the hypotenuse of the burner. The tilt angle is (45 ± 5)° with the horizontal, measured along the line from the hypotenuse midpoint to the specimen corner. See Figure E.36.

4.4.7 Shield of rectangular shape, width (370 ± 5) mm, height (550 ± 5) mm, made of calcium silicate board (specification the same as the backing boards), to protect the specimens from the heat flux of the flames of the auxiliary (secondary) burner.

It shall be fixed to the hypotenuse side of the auxiliary (secondary) burner, centred in the horizontal plane (shielding the total width of the diagonal plus (8 ± 3) mm at both sides) with the top edge (470 ± 5) mm above the top level of the auxiliary (secondary) burner.

4.4.8 Mass flow controller with a range of at least 0 g/s to 2,3 g/s and an accuracy of 1 % of the reading for the range 0,6 g/s to 2,3 g/s. The mass flow controller shall be calibrated annualy.

NOTE The propane flow of 2,3 g/s corresponds to a heat release of 107 kW using the effective lower heat of combustion of propane (46 360 kJ/kg). The accuracy of 1 % is when either using air, nitrogen or propane.

4.4.9 Switch, used to supply propane to either of the burners.