

# SLOVENSKI STANDARD

## SIST EN 1364-2:2018

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Nadomešča:  
SIST EN 1364-2:1999

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### Preskusi požarne odpornosti nenosilnih elementov - 2. del: Stropovi

Fire resistance for tests for non-loadbearing elements - Part 2: Ceilings

Feuerwiderstandsprüfungen für nichttragende Bauteile - Teil 2: Unterdecken

**iTeh STANDARD PREVIEW**  
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Essais de resistance au feu des elements non porteurs - Partie 2: Plafonds

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#### **ICS:**

13.220.50	Požarna odpornost gradbenih materialov in elementov	Fire-resistance of building materials and elements
91.060.30	Stropi. Tla. Stopnice	Ceilings. Floors. Stairs

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 1364-2**

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ICS 13.220.50; 91.060.30

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English Version

**Fire resistance for tests for non-loadbearing elements -  
Part 2: Ceilings**

Essais de résistance au feu des éléments non porteurs -  
Partie 2: Plafonds

Feuerwiderstandsprüfungen für nichttragende  
Bauteile - Teil 2: Unterdecken

This European Standard was approved by CEN on 8 October 2017.

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.

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

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## EN 1364-2:2018 (E)

## European foreword

This document (EN 1364-2:2018) 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of an identical text or by endorsement, at the latest by July 2018, and conflicting national standards shall be withdrawn at the latest by July 2018.

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 1364-2:1999.

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

The main changes with respect to the previous edition are listed below:

- a) locations of thermocouples are modified in line with the definitions in EN 1363-1;
- b) a more precise definition of the test specimen;
- c) more precise rules in the field of direct application.

EN 1364 ‘Fire resistance tests for non-loadbearing elements’ consists of the following:

- *Part 1: Walls*
- *Part 2: Ceilings*
- *Part 3: Curtain walling – full configuration*
- *Part 4: Curtain walling – part configuration*
- *Part 5: Air transfer grilles*

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

This European Standard has been prepared to provide a method of test for assessing the fire resistance of non-loadbearing ceilings. It is applicable to self-supporting ceilings as well as suspended ceilings, with either fire from below or from above.

This European Standard is not applicable to loadbearing systems. The fire resistance of loadbearing floors in conjunction with a suspended ceiling should be assessed by using EN 1365-2.

**Caution** — The attention of all persons concerned with managing and carrying out this fire resistance test is drawn to the fact that fire testing may be hazardous and that there is a possibility that toxic and/or harmful smoke and gases may be evolved during the test. Mechanical and operational hazards may also arise during the construction of the test elements or structures, their testing and disposal of test residues.

An assessment of all potential hazards and risks to health should be made and safety precautions should be identified and provided. 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.

**Safety note** — Monitoring for integrity by the cotton pad or other means and insulation by use of the roving thermocouple from above a test specimen (in the case of fire from below) or within a void beneath a fire test specimen (in the case of fire from above) can be hazardous unless the risks associated with these practices are considered and appropriate precautions taken to protect operators from radiation, smoke, hot gases and from contact with furnace flame.

Operators should not reach over the test specimen (in the case of fire from below) or enter the void beneath a test specimen (in the case of fire from above) to carry out inspection tests of any type during the test.

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## 1 Scope

This part of EN 1364 specifies a method for determining the fire resistance of ceilings, which in themselves possess fire resistance independent of any building element above them. This European Standard is used in conjunction with EN 1363-1.

The method is applicable to ceilings, which are either suspended by hangers or fixed directly to a supporting frame or construction, and to self-supporting ceilings.

Within this test method, the ceiling is exposed to fire, with the exposure being applied either:

- a) from below the ceiling, or
- b) from above the ceiling to simulate fire within the cavity above the ceiling.

The contribution to fire resistance which a suspended ceiling might provide as a protective membrane to loadbearing elements is determined using the procedure given in EN 13381-1. The fire resistance of loadbearing floors in conjunction with a suspended ceiling can also be assessed by using tests according to EN 1365-2.

## 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 1363-1:2012, *Fire resistance tests - Part 1: General Requirements*

EN 1363-2, *Fire resistance tests - Part 2: Alternative and additional procedures*

EN ISO 13943, *Fire safety - Vocabulary (ISO 13943)*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1363-1 and EN ISO 13943 and the following apply.

### 3.1

#### **ceiling**

non-loadbearing element of a building construction designed to provide horizontal fire separation

### 3.2

#### **self-supporting ceiling**

ceiling with a span between building constructions, without any additional hangers

### 3.3

#### **suspended ceiling**

ceiling which is suspended from a supporting construction

### 3.4

#### **cavity**

space between the upper surface of the ceiling and the underside of any floor, roof or its supporting construction



**3.5****test specimen**

full ceiling specimen submitted for test, including hangers, fittings, insulating materials and features such as lighting, ventilation and access and inspection panels

**3.6****supporting construction**

loadbearing construction to which a ceiling is attached for the test

**3.7****fittings**

devices penetrating the ceiling

EXAMPLE Lighting and ventilation systems not otherwise covered by a specific fire test.

**3.8****overrun time**

period of fire resistance (expressed in minutes) beyond the intended classification period achieved in the test

**4 Test equipment**

The test equipment shall be as specified in EN 1363-1:2012, Clause 4 or, if appropriate, EN 1363-2.

**5 Test conditions**

The heating and pressure conditions and the furnace atmosphere shall conform to the requirements given in EN 1363-1:2012, Clause 5 or, if applicable, EN 1363-2.

**6 Test specimen****6.1 Size****6.1.1 Self-supporting ceilings exposed to fire from below or from above**

When the ceiling in practice is equal to or greater than the size of the furnace opening, then it shall be tested at a size of at least 4 m × 3 m. The span of the ceiling shall be in the direction of the larger dimension (see also 6.3.2).

When the ceiling in practice is smaller than 4 m × 3 m, in either direction, then it shall be tested at full size. The furnace aperture shall be closed with some elements of adequate size, with the stiffness and stability required to support the test specimen.

**6.1.2 Suspended ceilings exposed to fire from below or from above**

The test specimen shall be of size so that at least 4 m × 3 m is exposed to the furnace conditions. The direction of the main components (see 6.3.2) shall be in the direction of the larger dimension.

When the ceiling in practice is smaller than 4 m × 3 m, in either direction, then it shall be tested at full size. The furnace aperture shall be closed with some elements of adequate size, with the stiffness and stability required to support the test specimen.

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## 6.2 Number

The number of test specimens shall be in accordance with EN 1363-1:2012, 6.2.

A single test specimen shall be tested unless the most onerous test configuration, identified in 6.3.2, cannot be defined, in which case separate tests shall be carried out for each configuration.

## 6.3 Design

### 6.3.1 General

The test specimen shall be fully representative of the ceiling intended for use in practice. It shall model the edges between the ceiling and walls, and the joints and jointing materials to be used in practice. It shall be designed to be mounted only from below.

The test specimen shall include any appropriate fittings which are an essential part of the ceiling and could influence its behaviour in test.

Where fixtures and fittings do not form an integral part of the ceiling (i.e. mandatory to install them in all cases), but may be installed in end use application, than one test has to be conducted without those fixtures and fittings and in a second full size test they have to be installed.

When the ceiling design includes both longitudinal and transverse joints, the test specimen shall include both such joints.

### 6.3.2 Orientation

If the longitudinal and transverse directions of the ceiling are constructed differently, the performance of the test specimen may vary depending upon the direction aligned with the longitudinal axis. The specimen shall be designed to represent the most onerous condition by arranging the more critical components parallel to the longitudinal axis. If the more onerous condition cannot be identified, two separate tests shall be carried out with the components arranged both parallel and perpendicular to the longitudinal axis.

### 6.3.3 Support conditions

The following support conditions for the ceilings are specified and shall be followed unless the sponsor requests otherwise. In this case the differing support conditions shall be described in the test report and the validity of the results shall be restricted accordingly.

Cavity barriers incorporated as a part of the test specimen are allowed.

When the test specimen is full size in both directions, it shall be fixed as in practice. When it is smaller in one or both directions than in practice the following support conditions shall apply:

- a) for a self-supporting ceiling, there shall be one free edge which shall be in the direction of the main supporting member. A gap of 25 mm to 50 mm shall exist between the free edge of the test specimen and the main supporting member. This gap shall be packed with a resilient non-combustible material, e.g. mineral fibre, to provide a seal without restricting freedom of movement. The 3 others edges shall be fixed to the supporting construction in a way to prevent any longitudinal movement of the edges or thermal expansion in either direction, other than that is provided for within the ceiling system.
- b) for a suspended ceiling, with fire from below, all edges shall be fixed to the supporting construction in a way to prevent any longitudinal movement of the edges or thermal expansion in either direction, other than that provided for within the ceiling system.

- c) for a suspended ceiling, with fire from above, two adjacent edges shall be fixed to the supporting construction in a way to prevent any longitudinal movement of the edges or thermal expansion in either direction, other than that provided for within the ceiling system. The other two edges shall not be restraint. A gap of 25 mm to 50 mm shall exist between the free edge of the test specimen and the main supporting member. This gap shall be packed with a resilient non-combustible material, e.g. mineral fibre, to provide a seal without restricting freedom of movement.

NOTE If in practice a gap is used at the edges of the ceiling system, this gap is incorporated into the test specimen.

## 6.4 Construction

The test specimen shall be constructed as described in EN 1363-1:2012, 6.4.

## 6.5 Verification

Verification of the test specimen shall be carried out as described in EN 1363-1:2012, 6.5.

# 7 Installation of test specimen

## 7.1 General

The test specimen shall be installed as far as possible in a manner representative of its use in practice. It shall be mounted from below without access from above, and be installed by the same method and procedures recommended in the installation manual which shall be provided by the sponsor.

The test specimen shall be mounted in a supporting construction or furnace to prohibit thermal elongation. Grid members shall be tightly fitted to a test frame or furnace walls in order that the thermal expansion behaviour of grid members and expansion devices may be correctly evaluated.

Profiles bearing the various components or panels of the ceiling shall be installed against each other without any gap, unless a gap or gaps is required for design purposes. In this case the gap or gaps shall be representative of practice and shall be installed within the test specimen.

Provisions for sealing the furnace shall be made when the test specimen is smaller than the furnace aperture.

## 7.2 Supporting construction

### 7.2.1 General

The test specimen shall be installed using a supporting construction according to the fire exposure conditions being evaluated as follows.

### 7.2.2 Exposure to fire from below

The test construction shall be open to the laboratory on its upper face (see Figure 1).

For suspended ceilings, these shall be supported by beams, (e.g. steel IPE 140) or other types of beams which are dimensioned to support the width and weight of the test specimen.

### 7.2.3 Exposure to fire from above

The upper fire compartment closure shall form a cavity of height of 1,5 m to 2 m.

For a self-supporting ceiling, an unloaded fire compartment closure, for example, aerated concrete slabs with a thickness of at least 120 mm, as shown in Figure 2, shall be used to close the furnace.