



SLOVENSKI STANDARD SIST EN 1366-5:2021

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Fire resistance tests for service installations - Part 5: Service ducts and shafts

Feuerwiderstandsprüfungen für Installationen - Teil 5: Installationskanäle und -schächte

Essais de résistance au feu des installations de service - Partie 5 : Gaines pour installation technique

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Fire resistance tests for service installations - Part 5: Service ducts and shafts

Essais de résistance au feu des installations de service -
Partie 5 : Gaines pour installation technique

Feuerwiderstandsprüfungen für Installationen - Teil 5:
Installationskanäle und -schächte

This European Standard was approved by CEN on 27 December 2020.

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.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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

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EN 1366-5:2021 (E)**European foreword**

This document (EN 1366-5:2021) 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of an identical text or by endorsement, at the latest by August 2021, and conflicting national standards shall be withdrawn at the latest by August 2021.

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 1366-5:2010.

Against EN 1366-5:2010 the following changes were introduced:

- 1) necessary dated references were updated;
- 2) clearer rules were given for the scope of the standard;
- 3) terms and definitions clarified and completed;
- 4) the location of thermocouples was clarified especially when testing the specimen including service outlets and access panels;
- 5) drawings were improved and aligned to changes;
- 6) the thermocouple T3 from Version 2010 was deleted. It is not needed for measuring the property „Integrity” and it leads to confusion concerning that property.

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

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The purpose of this test is to measure the ability of a service duct or shaft to resist the spread of fire from one fire compartment to another with fire attack from inside or outside the duct or shaft. The test specimens incorporate joints, service outlets and access openings as intended in practice and are suspended as they would be in practice. Test specimens of service ducts are not loaded as in practice but a standard load is included to represent a typical service load. Test specimens of service shafts are not loaded as in practice, but a standard load is included to represent a typical service load.

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 there is a possibility that toxic and/or harmful smoke and gases may be involved 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.

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EN 1366-5:2021 (E)**1 Scope**

This document specifies a method for determining the fire resistance of horizontal service ducts and vertical service shafts, which pass through walls or floors and enclose pipes and cables, to classify them according to EN 13501-2. The test scenario examines the behaviour of ducts and shafts exposed to fire either from outside or from inside the system. This document is intended to be read in conjunction with EN 1363-1.

This document does not examine the risk of fire spread as a result of thermal conduction along the piping or cabling installed in service ducts or shafts or thermal conduction through the media these pipes carry. It does not cover the risk of damage produced by thermal elongation or shortening of tubes and cables as a result of fire or damaged pipe suspensions. This document does not give guidance on how to test one, two or three sided service ducts or shafts.

NOTE Guidance on testing service ducts and shafts of less than four sides will be covered in the extended field of application rules being developed by CEN/TC 127.

This test can be used for systems with boards and also for such systems with continuous covering with intumescent materials on the boards. It cannot be used for systems where intumescent material is only applied in the range of the penetration.

This test is unsuitable for evaluating service ducts or shafts with internal barriers at walls and floors.

This test is unsuitable for evaluating fire protective systems for cable systems and associated components with maintenance of integrity in case of fire. This is covered by EN 1366-11: Fire protective systems for cable systems and associated components - Part 11: Fire protective systems for cable systems and associated components.

Whilst the walls of service ducts or shafts tested to this method may provide specified levels of integrity or insulation, testing according to this document does not replace the testing of the functional endurance of small electrical cables which is covered in EN 50200.

Fire resistance testing of ducts for air distribution systems is covered in EN 1366-1.

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 1363-1:2020, *Fire resistance tests — Part 1: General requirements*

EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN ISO 898-1:2013, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread (ISO 898-1:2009)*

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, EN ISO 13943 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 <https://www.iso.org/obp>

3.1

service duct

mainly horizontal duct enclosing combustible or non-combustible services, such as pipes or cables

3.2

service shaft

mainly vertical shaft enclosing combustible or non-combustible services, such as pipes or cables

3.3

shutter of access opening

openable door or panel allowing for access to the services within the duct or shaft

3.4

supporting construction

wall, partition or floor which the duct or the shaft passes through in the test

3.5

board

rigid product of cross-section in which the thickness is uniform and substantially smaller than the other dimensions of the installations

4 Test equipment

4.1 General

In addition to the test equipment specified in EN 1363-1, the following are required.

4.2 Furnace

The furnace shall be capable of subjecting service ducts and shafts to the standard heating and pressure conditions specified in EN 1363-1 and be suitable for testing horizontal ducts (see Figures 1 and 2) or vertical shafts (see Figures 3 and 4).

4.3 Loading equipment

Continuous stranded steel cables and/or the installations used in practice are used to apply load to the service duct or shaft to represent service loading.

4.4 Gas extraction equipment (optional)

If for safety reasons a laboratory requires to extract gases away from the open end of the duct or shaft, this shall not influence the test conditions.

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5 Test conditions

5.1 Furnace

The heating and pressure conditions and the furnace atmosphere shall conform to those given in EN 1363-1.

5.2 Loading

Horizontal service ducts shall be loaded when supporting service installations. In this case, the weight of the load shall be representative of that used in practice.

Vertical service shafts shall not be loaded except in the two following situations:

- when supporting service installations. In this case, the weight of the load shall be representative of that used in practice;
- when the service installation shaft is not supported on each floor or when the height between two supports is greater than 5 m. In this case a weight load representative for the additional shaft weight shall be added to the shaft top.

6 Test specimen

6.1 Size

6.1.1 General

Any cross section of duct or shaft may be tested as required by the sponsor.

6.1.2 Length

The minimum lengths of the parts of the test specimen inside and outside the furnace shall be as given in Table 1.

Table 1 — Straight length of test specimen

Orientation	Length m			
	Inside furnace		Outside furnace	
	fire outside	fire inside	fire outside	fire inside
Horizontal duct	≥ 4,0	0,25 ± 0,05	2,0 ± 0,05	2,5 ± 0,05
Vertical shaft ^a	≥ 2,0	0,25 ± 0,05	2,0 ± 0,05	2,0 ± 0,05
^a See also 5.2.				

6.1.3 Cross-section

The service ducts and shafts of the same construction type shall be tested with the maximum width and height and the minimum thickness as intended in practice.

6.2 Number

One test specimen shall be tested for each type of orientation, exposure conditions and cross-section.

6.3 Design

6.3.1 General

The test shall be made on a test specimen, representative of the complete service duct or shaft assembly.

6.3.2 Duct and shaft arrangement

6.3.2.1 General

The exposure condition (fire inside or fire outside) shall be as specified by the sponsor. Ducts shall be arranged as shown in Figures 1 or 2 and shafts shall be arranged as shown in Figures 3 or 4. Service ducts or shafts with fire exposure from outside will have no openings in the furnace (except access panels and service outlets). For service ducts or shafts exposed to an internal fire, the end of the service duct or shaft facing into the furnace shall be left open. No service ducts or service shafts shall contain anything other than the loading defined in 4.3.

If a service outlet is part of the system this service outlet shall be tested with a distance to the penetration through the wall or floor not lower than intended in practice.

Where used in practice, each service duct or shaft shall incorporate one access opening as follows:

- fire outside: inside furnace at mid-span of two suspensions;
- fire inside: as shown in Figure 2 (the dimensions may be applied also to vertical shafts).

For the test, the access opening shall be at the bottom of the duct except the access opening is in practice only on a side or on the top. In this case the access opening shall be installed as in practice. The width and height of the access opening shall be representative of the maximum dimensions used in practice, the thickness shall be the minimum dimension used in practice.

Vertical shafts shall be arranged as shown in Figures 3 or 4 and shall penetrate through the furnace roof slab/supporting construction. The shafts shall be supported at the furnace roof level as they would be supported in practice when penetrating a floor (as specified by the sponsor).

6.3.2.2 Joints in horizontal service ducts

For the fire test with fire from outside the test configuration shall include at least one joint inside and at least one joint outside the furnace. There shall be at least one joint for every layer, both inside and outside the furnace.

For the fire test with fire from inside these rules only apply for the part of the specimen outside the furnace.

Outside the furnace, the joint in the outer layer of the fire protection material shall be recorded and it may be not nearer than 100 mm to thermocouples T2 in accordance with 9.1. Inside the furnace, the joint in the outer layer of fire protection material shall be located at approximately mid-span. The location of joints in inner layers shall be as specified by the sponsor.

The distance between joints and suspension devices shall not be less than that used in practice. If the minimum distance has not been specified, suspension devices shall be arranged so that the joint at mid-span lies midway between them. Distances between the suspension devices shall be specified by the sponsor and shall be representative of practice.

6.3.2.3 Joints in vertical service shafts

For the vertical shaft exposed to fire from inside, the test configuration shall include at least one joint outside the furnace. There shall be at least one joint for every layer.