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Fire resistance tests for service installations - Part 9: Single compartment smoke extraction ducts

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 02/25

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# EUROPEAN STANDARD
# NORME EUROPÉENNE
# EUROPÄISCHE NORM

# EN 1366-9

October 2024

ICS 13.220.50; 91.140.30 Supersedes EN 1366-9:2008

English Version

# Fire resistance tests for service installations - Part 9: Single compartment smoke extraction ducts

Essais de résistance au feu des installations techniques - Partie 9 : Conduits d'extraction de fumées relatifs à un seul compartiment

Feuerwiderstandsprüfungen für Installationen - Teil 9: Entrauchungsleitungen für einen Einzelabschnitt

This European Standard was approved by CEN on 2 September 2024.

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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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. EN 1366-9:2024 E

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# European foreword

This document (EN 1366-9:2024) 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of an identical text or by endorsement, at the latest by April 2025, and conflicting national standards shall be withdrawn at the latest by April 2025.

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 1366-9:2008.

In comparison with the previous edition, the following technical modifications have been made:

— method for determination of reduction in internal cross-sectional area was added;

— positions for measurement of deflection of cross-section outside furnace were defined;

— introduction of an alternative oxygen sampling probe;

— use of two separate $O_2$ analysers based on paramagnetic measurement method for the two sampling points is mandatory;

— direct field of application for vertical parts of duct within the smoke compartment was added, without penetrating any wall/floor where fire resistance is required;

— details of holes in perforated plate for circular ducts were included in figures;

— standard for gas temperature thermocouples were added;

— location of compensators (if used) were amended.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

EN 1366, *Fire resistance tests for service installations* consists of the following parts:

— *Part 1: Ventilation ducts*

— *Part 2: Fire dampers*

— *Part 3: Penetration seals*

— *Part 4: Linear joint seals*

— *Part 5: Service ducts and shafts*

— *Part 6: Raised access and hollow core floors*

— *Part 7: Conveyor systems and their closures*

— *Part 8: Smoke extraction ducts*

— *Part 9: Single compartment smoke extraction ducts*

— *Part 10: Smoke control dampers*

— *Part 11: Fire protective Systems for cable systems and associated components*

— *Part 12: Non-mechanical fire barrier for ventilation ductwork*

— *Part 13: Chimneys*

— *Part 14: Partial penetration seals*

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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, Türkiye and the United Kingdom.

# Introduction

This part of this European Standard has been prepared because a method of test for smoke extraction ducts used in single compartment applications has become necessary. This test exposes a smoke extraction duct to conditions intended to represent the pre-flashover stage of a fire.

Leakage is measured at both ambient temperature and exposure at 600 °C. During the tests, air/gases are drawn through the duct at a differential pressure between the inside and outside of the duct. Leakage is determined at ambient temperature by sealing the openings in the duct located in the furnace and taking flow measurements through a flow measuring device located just before the extraction fan. With respect to determining leakage at 600 °C, oxygen-measuring techniques are used.

**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.

# 1 Scope

This part of EN 1366 specifies a test method for determining the fire resistance of smoke extraction ducts that are used for single compartment applications only. In such applications, the smoke extraction system is only intended to function up to flashover (typically 600 °C).

This method of test is only suitable for ducts constructed from non-combustible materials (class A1 and A2-s1, d0 according to EN 13501-1).

It is applicable only to four sided and circular ducts. One-, two- and three-sided ducts are not covered. This document is applicable only for the standard sizes or smaller as described.

This test method of part 9 is applicable only to smoke extraction ducts that do not pass into other fire compartments. For smoke extraction ducts that pass into other compartments, the method of test described in EN 1366-8 is used.

The smoke extraction duct is part of the smoke extraction system which also includes smoke control dampers and smoke extract fans.

# 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, *Fire resistance tests — Part 1: General requirements*

EN 1366-1, *Fire resistance tests for service installations — Part 1: Ventilation ducts*

EN 1507, *Ventilation for buildings — Sheet metal air ducts with rectangular section — Requirements for strength and leakage*

EN 12237, *Ventilation for buildings — Ductwork — Strength and leakage of circular sheet metal ducts*

EN 10095, *Heat resisting steels and nickel alloys*

EN 13501-4, *Fire classification of construction products and building elements — Part 4: Classification using data from fire resistance tests on components of smoke control systems*

EN 60584-1, *Thermocouples — Part 1: EMF specifications and tolerances (IEC 60584-1)*

EN ISO 5167-1, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 1: General principles and requirements (ISO 5167-1)*

EN ISO 5167-2, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 2: Orifice plates (ISO 5167-2)*

EN ISO 5167-3, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 3: Nozzles and Venturi nozzles (ISO 5167-3)*

ISO 10294-3:1999, *Fire resistance tests — Fire dampers for air distribution systems — Part 3: Guidance on the test method*

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

ISO 5221, *Air distribution and air diffusion — Rules to methods of measuring air flow rate in an air handling duct*