SLOVENSKI STANDARD
SIST EN 12101-7:2011

01-oktober-2011

Nadomešča:
OSIST prEN 12101-7:2004

Sistemi za nadzor dima in toplote - 7. del: Kanali za nadzor dima

Smoke and heat control systems - Part 7: Smoke duct sections

Rauch- und Wärmefreihaltung - Teil 7: Entrauchungsleitungen

Systèmes pour le contrôle des fumées et de la chaleur - Partie 7: Tronçons de conduit de désenfumage

Ta slovenski standard je istoveten z: EN 12101-7:2011

ICS:

13.220.20	Požarna zaščita	Fire protection
91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning

SIST EN 12101-7:2011 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12101-7

May 2011

ICS

English Version

Smoke and heat control systems - Part 7: Smoke duct sections

Systèmes pour le contrôle des fumées et de la chaleur - Partie 7: Tronçons de conduit de désenfumage

Rauch- und Wärmefreihaltung - Teil 7: Entrauchungsleitungen

This European Standard was approved by CEN on 17 March 2011.

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.

CEN members are the national standards bodies of 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 12101-7:2011: E

Contents

Page

Foreword

This document (EN 12101-7:2011) has been prepared by Technical Committee CEN/TC 191 “Fixed firefighting systems”, 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 November 2011, and conflicting national standards shall be withdrawn at the latest by November 2011.

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 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).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This European Standard has the general title “*Smoke and heat control systems*” and consists of the following separate Parts:

Part 1: Specification for smoke barriers,

Part 2: Specification for natural smoke and heat exhaust ventilators,

Part 3: Specification for powered smoke and heat exhaust ventilators,

Part 4: Installed SHEVS systems for smoke and heat ventilation (Technical Report (TR)),

Part 5: Guidelines on functional recommendations and calculation methods for smoke and heat exhaust ventilation systems (TR),

Part 6: Specification for pressure differential systems – Kits,

Part 7: Smoke duct sections (this standard),

Part 8: Smoke control dampers,

Part 9: Control panels,

Part 10: Power supplies.

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, Croatia, 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 the United Kingdom.

Introduction

This European Standard contains the basic performance and requirements for smoke control duct sections, which are to be used in conjunction with pressure differential systems and smoke and heat control systems. They may also be used to pressurise when gas extinguishing systems are used.

Particular reference is required to EN 1366-8 and EN 1366-9, which define the fire resistance testing associated with these products and EN 13501-4, which provides details on their fire resistance classification.

In addition to the prevention of transmission of smoke and combustion products from a fire zone, smoke control duct sections are utilised to contain the spillage of otherwise harmful and toxic extinguishing gases from the affected area, and for the control of pressurising and excess air relief within pressurisation systems.

Smoke control systems are designed to fulfil three basic functions. These are:

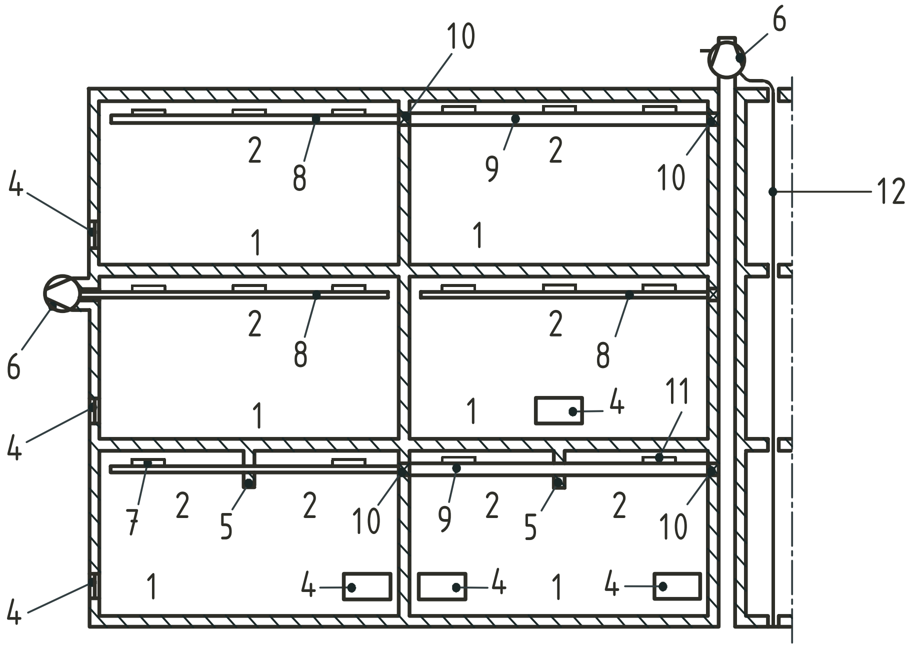
a) the extraction of smoke from a single fire compartment to the outside of the building;

b) the extraction of smoke from fire compartments of a building, using a SHEVS connected to one or more fire compartments. The smoke control duct may or may not pass through other compartments of the building to reach the outside of the building;

c) the use of pressurisation to maintain smoke free clear areas.

Smoke control ducts are commonly used in smoke and heat control systems. They may serve single compartments or a number of different fire compartments. The systems may be dedicated smoke extraction or possibly a combined environmental ventilation/smoke extraction.

The smoke and heat control system may remove smoke using either high temperature fans (in accordance with EN 12101-3) or natural ventilators (in accordance with EN 12101-2).



Key

1 Fire compartment

2 Smoke reservoir

4 Air inlet

5 Smoke barrier

6 Powered smoke and heat exhaust ventilator (fan)

7 Smoke control dampers for single compartments (FprEN 12101-8 and prEN 1366-10)

8 Smoke control duct sections for single compartments (FprEN 12101-7 and EN 1366-9)

9 Smoke control duct sections for multi compartments (FprEN 12101-7 and EN 1366-8)

10 Smoke control dampers for multi compartments (FprEN 12101-8 and prEN 1366-10) mounted inside or outside of wall or floor

11 Smoke control dampers for multi compartments (FprEN 12101-8 and prEN 1366-10) mounted on the surface of the duct

12 Electrical equipment

Figure 1 – Example of powered smoke and heat exhaust ventilation

Further guidance on the application of smoke control ducts may be found within the rest of the EN 12101 series of harmonised standards and technical reports.

The areas for which products supplied to this European Standard are considered applicable include for example:

a) commercial premises,

b) shopping and retail centres,

c) hospitals,

d) multi-residential buildings.

Smoke control duct sections are intended for use in the following types of systems, including:

a) pressurisation,

b) pressure relief,

c) extraction systems,

d) ductwork systems,

e) inerting fire suppression systems.

It is realised that all the above systems do not address smoke directly, but similar properties are required of such smoke control ducts to limit leakage in a fire and smoke control situation.

1 Scope

This European Standard applies to smoke control duct sections, placed on the market and intended to operate as part of a pressure differential system or smoke and heat exhaust system. This standard specifies requirements and gives reference to the test methods defined for smoke control duct sections and their associated components (for example, hangers and other items proven at the time of testing), which are intended to be installed in such systems in buildings. It also provides for the evaluation of conformity of the products to the requirements of this standard. Furthermore, marking and information on installation and maintenance of these products are also given in this European Standard.

To avoid duplication, reference is made to a variety of other standards. To this end, this standard is to be read in conjunction with EN 1366-8, EN 1366-9 and EN 1366-1, for details of the fire resistance testing and EN 13501-4 for corresponding classification.

This standard has not considered in detail the detrimental and/or corrosive effects that may be caused by process chemicals present in the atmosphere, which are drawn through the system intentionally or inadvertently.

This European Standard also governs associated components used together with smoke control duct sections such as turning vanes and silencers, with the exception of natural and powered smoke ventilators and smoke control dampers, which are covered by separate standards.

Ducts for use other than in smoke and heat exhaust/control systems are not covered by this standard.

2 Normative references

The following referenced documents are indispensable for the application 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 1366-1, *Fire resistance tests for service installations – Part 1: Ducts*

EN 1366-8, *Fire resistance tests for service installations – Part 8: Smoke extraction ducts*

EN 1366-9, *Fire resistance tests for service installations – Part 9: Single compartment smoke extraction ducts*

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 ISO 13943, *Fire safety – Vocabulary (ISO 13943:2008)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 13943, together with the following apply.

3.1
air inlet
device connected to outside air to allow the inlet of air from outside the construction works

3.2
elevated temperature
temperatures in excess of normal ambient air, below those necessary for fire resistance testing, to which smoke and heat exhaust ducts for single compartments are tested

3.3
fire compartment
enclosed space, comprising one or more separate spaces, bounded by elements of construction having a specified fire resistance and intended to prevent the spread of fire (in either direction) for a given period of time

3.4
natural smoke and heat control system
smoke and heat ventilation system which uses natural ventilation

NOTE Natural ventilation is caused by buoyancy forces due to differences in density of the gases because of temperature differences.

3.5
penetration seal
product used between the smoke control duct and the fire compartment boundary structure to maintain the fire resistance, when tested and having met the requirements of EN 1366-8, at the position where a smoke control duct passes through the element

3.6
powered smoke and heat exhaust system
smoke and heat ventilation system which utilises a number of hot gas fans that are suitable for handling hot gases for a limited period of time which causes the positive displacement of gases

3.7
pressure differential systems
system of fans, ducts, vents and other features provided for the purposes of creating a lower pressure in the fire zone than in the protected space, see EN 12101-6

3.8
smoke and heat exhaust ventilation system (SHEVS)
system consisting of products and/or components jointly selected to exhaust smoke and heat

NOTE The products and/or components form a system in order to establish a buoyant layer of warm gases above cooler cleaner air.

3.9
smoke and heat exhaust ventilator (SHEV)
device specially designed to move smoke and hot gases out of a construction works under conditions of fire

3.10
smoke barrier
barrier to restrict the spread of smoke and hot gases from a fire, forming part of the boundary of a smoke reservoir or used as a channelling screen, or used as a void edge boundary

3.11
smoke control damper
device automatically or manually activated, which may be open or closed in its operational position, to control the flow of smoke and hot gases into, from or within a duct

3.12
smoke control duct - horizontal
smoke control duct which passes horizontally through vertical walls

3.13
smoke control duct - multi compartment fire resisting
fire resisting smoke control ducts, built from more than one smoke control duct section, for use in multi compartment applications designed to transport smoke and/or hot gases away from the source of a fire

NOTE May also have a dual function as a normal air conditioning duct.

3.14
smoke control duct - single compartment
smoke control ducts, built from more than one smoke control duct section, for use within single fire compartment application designed to transport smoke and/or hot gases away from the source of a fire

NOTE May also have a dual function as a normal air conditioning duct.

3.15
smoke control duct - section
element of smoke control duct constructed to form part of a smoke control system

3.16
smoke control duct - vertical
smoke control duct which passes vertically through horizontal floors

3.17
smoke layer
layer of smoke that stabilises underneath the roof due to the affect of temperature gradient

3.18
smoke reservoir
region within a building limited or bordered by smoke barriers or structural elements and which will, in the event of a fire, retain a thermally buoyant smoke layer

3.19 smoke zone
structural supports
means of retaining the smoke control duct to the building structure

4 Smoke control duct section requirements

4.1 General

4.1.1 Fire resistance - multi compartment smoke control duct section

The multi compartment smoke control duct section shall demonstrate the following and shall be classified in accordance with EN 13501-4:

a) integrity: this shall be tested in accordance with test method in 5.2 and the integrity classification (E) declared;

b) insulation: this shall be tested in accordance with test method in 5.2 and the insulation classification (I) declared;

c) leakage: this shall be tested in accordance with test method in 5.2 and the leakage classification (S) declared;

d) mechanical stability: this shall be tested in accordance with test method in 5.2 and forms part of the integrity classification (E) declared;

e) maintenance of cross section: this shall be tested in accordance with test method in 5.2 and forms part of the integrity classification (E) declared.