SLOVENSKI STANDARD
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Prezračevanje stavb - Požarne lopute

Ventilation for buildings - Fire dampers

Lüftung von Gebäuden - Brandschutzklappen

Ventilation des bâtiments - Clapets coupe-feu

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Ventilation for buildings - Fire dampers

Ventilation des bâtiments - Clapets coupe-feu

Lüftung von Gebäuden - Brandschutzklappen

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European foreword

This document (prEN 15650:2020) has been prepared by Technical Committee CEN/TC 156 “Ventilation for buildings”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15650:2010.

This document has been prepared under a standardization request given to CEN and CENELEC by the European Commission and the European Free Trade Association, and supports basic work requirements of Regulation (EU) 305/2011.

For relationship with EU Regulation, see informative Annex ZA, which is an integral part of this document.

In addition to a number of editorial revisions, the following main changes have been made with respect to EN 15650:2010:

— addition of more accurate definitions of fire dampers in Clause 3;

— addition of additional requirements and methodology to assess fire reaction of the product fire dampers as a whole as an optional performance;

— modification of the drafting of Clause 6 and Annex ZA in accordance with the introduction of AVCP provisions and the template of Annex ZA agreed at the CEN level.

Introduction

A fire damper is used to prevent fire and reduce smoke spreading through the air ductwork system which may penetrate fire separating walls and floors. Annex A gives descriptions of typical fire dampers.

In the case of fire or elevated temperatures, the fire dampers should close automatically by means contained within their own construction (e.g. a sensing element). As an addition, fire dampers may be closed by an external signal.

All fire dampers close automatically in response to raised temperatures indicating fire.

Fire dampers can be closed or reset locally at the fire damper or remotely using controls (e.g. maintenance, testing).

In addition, the aerodynamic performance of fire dampers should be tested in accordance with EN 1751, if such information is to be presented by a manufacturer.

Example of inspection and maintenance procedure is given in Annex D.

1 Scope

This document specifies requirements and gives reference to the test methods defined for fire dampers, which are intended to be installed in general Heating and Ventilating (HVAC) installations in buildings. All fire dampers close automatically in response to raised temperatures indicating fire. This document gives details for the provision of evaluation of conformity and marking of fire dampers.

Fire dampers meeting the requirements of this document may be considered suitable for both ducted and non-ducted applications.

This document applies to fire dampers with a declared specific fire resistance (Mandate M/117) that are to be used in conjunction with partitions to maintain fire compartments.

This document is not applicable to fire dampers that may be used in applications where the presence of process chemicals may affect fire damper performances.

This document is not applicable to non-mechanical fire barriers nor to air transfer grilles.

To avoid duplication, reference is made to a variety of other standards. To this end, it is advised to read this document in conjunction with EN 1366-2 for details of the fire resistance testing and EN 13501-3 for classification.

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 1366-2, *Fire resistance tests for service installations — Part 2: Fire dampers*

EN 1751, *Ventilation for buildings — Air terminal devices — Aerodynamic testing of damper and valves*

EN 12792, *Ventilation for buildings — Symbols, terminology and graphical symbols*

EN 13501-3, *Fire classification of construction products and building elements — Part 3: Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers*

EN 60068-2-52, *Environmental testing — Part 2: Tests — Test Kb: Salt mist, cyclic (sodium chloride solution) (IEC 60068-2-52)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN ISO 5135, *Acoustics — Determination of sound power levels of noise from air-terminal devices, air-terminal units, dampers and valves by measurement in a reverberation room (ISO 5135)*

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

ISO 21925-1, *Fire resistance tests — Fire dampers for air distribution systems — Part 1: Mechanical dampers*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in EN 12792, EN ISO 13943 and the following apply.

ISO and IEC maintain terminological databases for the 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
fire damper
device for use in Heating, Ventilation and Air Conditioning (HVAC) systems at fire boundaries to maintain compartmentation and protect means of escape in case of fire

3.2
actuating mechanism
mechanism, integral or directly associated with the fire damper which, when initiated by the fire damper release device, causes the movable component of the fire damper to change from the "open" to the "closed" position

3.3
actuator
device that moves the fire damper from the closed to open position and/or from the open to the closed position, or allows the fire damper to modulate between open and closed positions and may provide holding functionality at either/both the open or closed position

3.4
thermal release mechanism
mechanism, containing/linked to the sensing element, that causes the open fire damper to release and close in response to elevated temperature

3.5
sensing element
device that senses temperature, that causes the thermal release mechanism to activate at a defined elevated temperature

3.6
cycle
fire damper moving from the open position to the closed position and back to the open position or between the upper position to the lower position and back to the upper position for modulating fire dampers

4 Product characteristics

4.1 General

Clause 4 gives details of the essential characteristics, specific design requirements and additional optional test standards.

4.2 Nominal activation conditions/sensitivity

4.2.1 General

The proxy characteristics given in 4.2.2 and 4.2.3 shall be taken into account. The thermal release mechanism shall be equipped with a sensing element.

This characteristic is not essentially relevant to the prime intended use of the fire damper for providing fire resistance to maintain compartmentation, but it does support it for full safety and security.

4.2.2 Sensing element load bearing capacity

The sensing element shall be tested in accordance with the test method referred to in 5.1.1 for load bearing capacity (faulty set off). The sensing element shall be proven to maintain its load bearing capacity for a minimum of 1 h.

4.2.3 Sensing element response temperature

The sensing element shall be tested in accordance with the test method referred to in 5.1.2 for response temperature (response behaviour). The sensing element shall be proven to not exceed the time equalling the average of the threshold time plus 10 % or 4 min.

4.3 Response delay (response time to fire)

4.3.1 General

The proxy characteristic in 4.3.2 shall be taken into account.

This characteristic is not essentially relevant to the prime intended use of the fire damper for providing fire resistance to maintain compartmentation, but it does support it for full safety and security.

4.3.2 Closure time

The fire damper shall close in 2 min and/or demonstrates that it meets a minimum of the E classification requirements at 5 min in accordance with the test method referred to in 5.2.

4.4 Operational reliability

4.4.1 General

The proxy characteristics in 4.4.2 shall be taken into account.

This characteristic is not essentially relevant to the prime intended use of the fire damper for providing fire resistance to maintain compartmentation, but it does support it for full safety and security.

4.4.2 Cycling

4.4.2.1 General

The operational reliability of a fire damper shall be demonstrated by cycling to achieve at least one of the application categories in 4.4.2.2 to 4.4.2.4.

4.4.2.2 Fire dampers for emergency use only

Fire dampers for emergency use only shall only be expected to be tested / operated once or twice in a year.

They shall not form part of a controlled HVAC system and shall not be used on a daily or weekly basis for thermal isolation or for testing purposes but shall remain open at all times except for maintenance. However, they may be connected to an emergency system so they close when needed. This application category includes the following types of fire damper:

— manual;

— remote triggering, manual reset;

— remote triggering, actuator reset, local hold open.

Fire dampers for emergency only shall be cycle tested following the details given in Annex C, Table C.1 (300 cycles minimum).

The typical fire damper descriptions are given in Annex A.

4.4.2.3 Fire dampers for use in HVAC systems that are operated regularly for testing and thermal isolation purposes

Fire dampers for use in HVAC systems that are operated regularly (e.g. for testing, thermal isolation purposes) shall be expected to be operated regularly.

This application category includes the following types of fire damper:

— remote triggering, actuator reset, local hold open;

— remote triggering, actuator reset, actuator hold open.

Fire dampers for use in HVAC systems that are operated regularly for testing and thermal isolation purposes shall be cycle tested following the details given in Annex C, Table C.1 (10 200 cycles minimum).

4.4.2.4 Fire dampers for use in HVAC systems that are operated regularly for testing and thermal isolation and air modulation purposes

Fire dampers for use in HVAC systems that are operated regularly (e.g. for testing, thermal isolation, air modulation, balancing purposes) shall be expected to be operated regularly.

This application category includes the following types of fire damper:

— remote triggering, actuator reset, actuator hold open.

Fire dampers for use in HVAC systems that are operated regularly for testing and thermal isolation purposes and air modulation shall be cycle tested following the details given in Annex C, Table C.1 (20 200 cycles minimum).

4.5 Resistance to fire

4.5.1 General

The proxy characteristics in 4.5.2 to 4.5.6 shall be taken into account.

These characteristics represent the prime intended use of the fire damper for providing fire resistance to maintain compartmentation. The fire damper is unviable without them.

Resistance to fire shall be demonstrated by having a minimum value for Integrity of 30 min, or a combination of Integrity and Insulation of 15 min.

Classification for fire dampers shall be in accordance with EN 13501-3, where specific time requirements and other parameters are given.

4.5.2 Integrity

Integrity shall be determined using a fire resistance test in accordance with the information and test methods in 5.4.2 using the largest size of fire damper proposed.

This fire damper shall meet the criteria shown in 5.4.2 that allows it to meet the minimum requirements for classification E – Integrity.

4.5.3 Insulation

Insulation shall be determined using a fire resistance test in accordance with the information and test methods in 5.4.3 using the largest size of fire damper proposed.

This fire damper shall meet the criteria shown in the test standard that allows it to meet the minimum requirements for classification I - Insulation and E – Integrity.

4.5.4 Smoke leakage

To determine the smoke leakage characteristic, the following tests shall be performed:

a) The largest fire damper proposed shall be tested for leakage and shall meet the ambient leakage requirements for classification S – Smoke leakage.

b) The above fire damper of the largest size proposed shall then be fire resistance tested in accordance with test method in 5.4.4. This fire damper shall meet the criteria that allows it to meet the requirements for classification E – Integrity and S – Smoke leakage.

c) The smallest fire damper proposed shall also be tested for ambient leakage and this shall also meet the ambient leakage requirements for S – Smoke leakage.

4.5.5 Mechanical stability

Mechanical stability shall be demonstrated by achieving integrity in accordance with 5.4.5 (see 4.5.2).

4.5.6 Maintenance of cross section

Maintenance of cross section shall be demonstrated by achieving integrity in accordance with 5.4.6 (see 4.5.2).

4.6 Durability

4.6.1 General

The proxy characteristics in 4.6.2 and 4.6.3 shall be taken into account.

These characteristics are not essentially relevant to the prime intended use of the fire damper for providing fire resistance to maintain compartmentation, but they do support it for full safety and security.

4.6.2 Durability of response delay

Durability of response delay shall be demonstrated by meeting the requirements defined for Nominal activation conditions/sensitivity and the fire damper shall meet the requirements shown for sensing element response temperature shown in 4.2.3 and the sensing element load bearing capacity shown in 4.2.2.

4.6.3 Durability of operational reliability

Durability of operational reliability shall be demonstrated by meeting the requirements defined for operational reliability and the fire damper shall meet at least one of the cycling application categories shown in 4.4.2.2, 4.4.2.3, 4.4.2.4.

4.7 Reaction to fire (RTF) performance

There are no specific RTF requirements for fire dampers. However, certain countries need reaction to fire assessment of components used in fire dampers.

Reaction to fire classifications follow the requirements of EN 13501-1.

In general, the main components of fire dampers such as blades and casings meet or exceed a reaction to fire classification of A2-s1, d0 and only small amounts of material with lower classification are used.