BS EN 15423:2008

Ventilation for buildings — Fire precautions for air distribution systems in buildings

ICS 13.220.50,91.140.30,

National foreword

This British Standard is the UK implementation of EN 15423:2008.

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Ventilation for buildings - Fire precautions for air distribution systems in buildings

Systèmes de ventilation des bâtiments - Sécurité incendie pour les systèmes de distribution d'air dans les bâtiments

Lüftung von Gebäuden - Brandschutz von Lüftungsanlagen in Gebäuden

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Contents

Foreword

This document (EN 15423:2008) has been prepared by Technical Committee CEN/TC 156 “Ventilation for 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of an identical text or by endorsement, at the latest by November 2008, and conflicting national standards shall be withdrawn at the latest by November 2008.

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1 Scope

This document gives guidance for system designers, installers, commissioners and maintenance teams on the incorporation of protective measures for air distribution systems including dual purpose systems for smoke and heat exhaust systems within buildings, to prevent the initiation and the spread of fire, smoke and other by-products of combustion.

This document intends to only support any national (building) regulations, which are the basis of any design of a building or parts of it. It is up to the designer to enquire about the suitability (in particular in legal terms) of a specific solution given in this document (e.g. although “dual purpose systems” are covered in this document, they may not be permitted in some Member States or only in certain types of buildings).

This document applies to all air distribution systems including dual purpose systems (except systems only dedicated to smoke exhaust systems, which are dealt in other European standards) including technical rooms or spaces for the installation of devices to assist in ventilation of a building (e.g. distance of storage of combustible materials to devices and not the fire resistance of the building structure), penetrations, and following components/products used in the system like:

— inlet/outlet louvres;

— fans not exposed / exposed to the smoke;

— air control dampers;

— ducts;

— fire control dampers;

— air terminal devices;

— anchors and supports;

— duct fittings;

— control panels;

— cables and connections;

— air handling units;

— air filters;

— sound attenuators;

— heat exchangers.

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 1364-2, *Fire resistance test for non loadbearing elements - Part 2: Ceilings*

EN 1366-1, *Fire resistance tests for service installations - Part 1: Ducts*

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

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*

prEN 1366-10, *Fire resistance tests for service installations - Part 10: Smoke control dampers*

EN 1505, *Ventilation for buildings - Sheet metal air ducts and fittings with rectangular cross section - Dimensions*

EN 1506, *Ventilation for buildings - Sheet metal air ducts and fittings with circular cross section - Dimensions*

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

EN 12101-3, *Smoke and heat control systems - Part 3: Specification for powered smoke and heat exhaust ventilators*

prEN 12101-8, *Smoke and heat control systems - Part 8: Specification for smoke control dampers*

prEN 12101-9, *Smoke and heat control systems - Part 9: Control panels*

EN 12097, *Ventilation for buildings - Ductwork - Requirements for ductwork components to facilitate maintenance of ductwork systems*

EN 12792:2003, *Ventilation for buildings - Symbols, terminology and graphical symbols*

EN 13053, *Ventilation for buildings - Air handling units - Rating and performance for units, components and sections*

EN 13403, *Ventilation for buildings - Non-metallic ducts - Ductwork made from insulation ductboards*

EN 13501-1, *Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests*

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 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 13964, *Suspended ceilings - Requirements and tests methods*

EN 1886:2007 *Ventilation for buildings - Air handling units - Mechanical performance*

EN 13779, *Ventilation for non-residential buildings - Performance requirements for ventilation and room-conditioning systems*

EN 12237, *Ventilation for buildings - Ductworks - Strength and leakage of circular sheet metal ducts*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 12792:2003, together with the following apply.

3.1
shaft
space generally encased with building elements, where ventilation ducts and possibly other pipes and cables are located

3.2
support
device for a system component, e.g. fire damper, silencer, etc. to bear a load

3.3
inlet/outlet louvre
device, consisting of an assembly of parallel sloping vanes, intended to permit the passage of air, while providing a measure of protection against environmental influences

[EN 12792:2003, Table 1, number 242]

3.4
air control damper
element inserted into an air distribution system or element of an air distribution system permitting modification of the air resistance of the system, and consequently changing the air flow rate (dampers), or shutting off the air flow completely (valves), or controlling the air flow rate and in addition providing shut-off of the air flow (control valves)

[EN 12792:2003, Table 1, number 95]

3.5
fire damper
mobile closure within a duct, which is designed to prevent the passage of fire

[EN 1366-2]

3.6
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

[prEN 1366-10]

3.8
air terminal devices
component of a ventilation installation which is designed with the purpose of achieving the predetermined movement of air into or from a treated space

[EN 12792:2003, Table 1, number 31]

3.9
air transfer devices
air terminal device designed to allow the transfer of air from one space/room to another space/room

[EN 12792:2003, Table 1, number 36]

3.10
local requirement
legal requirement to comply with, from a regulation implemented in a country

NOTE Local requirement could deal with characteristics of products, installation, commissioning, maintenance… Most of the time, these requirements come from Fire Safety Regulations.

3.11
control equipment
any initiating device for a smoke and heat control system component e.g. control panel, basic control panel, mechanical control panel

3.12
control panel
multi-operation initiating device for a smoke and heat control system

4 Air distribution system

4.1 General requirements

Components in the air distribution system shall be made or installed in such a way that they will not increase the hazard of spreading fire and smoke gases in the case of fire. The materials used in buildings, air distribution systems and their components shall not contribute to the development of fire in accordance with any local requirement.

If there are local requirements on the reaction to fire of materials and/or resistance to fire, they shall be observed.

4.2 Design of air distribution systems

Air distribution systems shall be turned off in case of fire, unless local requirements allow for other procedures.

4.3 Installation

Use the manufacturer's instructions for all components.

The sealings through fire resistance enclosures (e.g. ceiling or walls), shall be in accordance with local requirements.

5 Requirements for components intended for fire precautions

5.1 General

The performance, which will be achieved by the product in end-use conditions, shall reflect the results of product fire resistance, fire reaction and smoke control testing, when required, and in accordance with the local regulations, if any. A product shall be tested as a complete assembly with all necessary components which affect fire resistance performance as described in the product standard.

Optional accessories can be available for a product.

Two types of accessories can be provided:

— fire tested accessory,

— non fire tested accessory; these need to be studied and calculated inside the complete design of the complete ventilation system.

When accessories, modifications, coatings etc. affect fire resistance performance, the product shall be tested both with and without these (for example: with and without painting) and conform to relevant standards.

NOTE When accessories do not affect fire resistance performance, they can be supplied and fitted on site.

Annex B presents relevant standards for each component and their characteristics.

5.2 Inlet/outlet louvres

5.2.1 Component

If the louvres are on the external wall of the building no special requirement is needed.

5.2.2 Installation

Location of inlet and outlet louvres shall be in accordance with EN 13779.

5.2.3 Commissioning

Conformity with the installation design shall be checked, in particular the minimum distance, defined according to 5.2.2, between the inlet and outlet louvres.

5.2.4 Maintenance – Routine

A visual check of the louvres shall be performed during ductwork maintenance operations. The air intake or discharge cross-section shall be free from foreign items such as rubbish, birds or insects etc.

5.3 Fans

5.3.1 Fans for ventilation only

5.3.1.1 Component

As a fire precaution the fan electric motor shall be equipped with internal or external thermal overload protection. Depending on the application, it may be used to switch off the motor or to warn of a thermal overload.

If necessary fans should be protected, and when they are not connected to a duct they should be protected with metal screens, grids or similar to prevent the entrance of paper, rubbish, and similar foreign material.

For fans in air handling units, see also 5.12.

5.3.1.2 Installation

Fans shall be located, arranged and installed to afford access for commissioning and maintenance.

Fans shall be installed in accordance with the relevant standards and the manufacturer's instructions.

In order to reduce the propagation of fire initiated by the fan, a free area (area that has no contact with any part of the fan) should be allowed around installed fans and motors. If there is no free area, all materials should be fire rated according to national regulations.

The fan shall be stopped in case of fire either manually or automatically depending on the system design.

5.3.1.3 Commissioning

See Clause 6.

Make sure, by turning on the fan, it is running properly.

Check that the rated intensity does not exceed the nominal value indicated on the product nameplate.

5.3.1.4 Maintenance – Routine

See Clause 6.

In addition, the free area shall be checked visually. The electrical motor shall be checked in accordance with the manufacturer's instructions and the alignment of the fan belt drives shall be controlled.

5.3.2 Fans for ventilation and air supply in smoke exhaust system

5.3.2.1 Component

As a fire precaution, the fan electric motor shall be equipped with internal or external thermal overload protection. Depending on the application, it may be used to switch off the motor or to warn of a thermal overload.

If necessary, fans should be protected and when they are not connected to a duct they should be protected with metal screens, grids or similar to prevent the entrance of paper, rubbish, and similar foreign material.

5.3.2.2 Installation

Fans shall be located, arranged and installed to afford access for commissioning and maintenance.

Fans shall be installed in accordance with the manufacturer's instructions.

In order to reduce the propagation of fire initiated by the fan, a free area (area with no contact with any part of the fan) should be provided around installed fans and motors. If there is no free area, all materials should be fire rated according to national regulations.

The air distribution system shall ensure that the fan operates in accordance with the specific requirements of the intended application and particularly the fan shall continue to run in case of smoke.

5.3.2.3 Commissioning

See Clause 6.

Make sure, by turning on the fan, it is running properly.

Check that the electrical intensity does not exceed the nominal value indicated on the product nameplate

5.3.2.4 Maintenance – Routine

See Clause 6.

5.3.3 Fans for ventilation and smoke control (dual purpose)

5.3.3.1 Component

The fan shall be tested according to EN 12101-3 and classified in accordance to EN 13501-4.

5.3.3.2 Installation

In case of fire, the control system shall give priority to the safety function of the fan.

If the fan is used for ventilation and assistance in case of fire, the following applies:

— fan shall continue to run in case of fire;

— air distribution system shall ensure that the fan operates in accordance with the specific requirements of the intended application.

5.3.3.3 Commissioning

See Clause 6.

Make sure, by turning on the fan, it is running properly.

Check that the electrical intensity does not exceed the nominal value indicated on the product name plate.

When a specific sequencing of response is specified (cascade starting of fans, fan delays to allow opening of the dampers, etc), these sequences shall be tested.

5.3.3.4 Maintenance – Routine

See Clause 6.

5.4 Air control dampers

5.4.1 General

This clause applies to flow control dampers only.

For other dampers, see 5.6.

5.4.2 Component

When the air to be extracted contains corrosive gases in quantities harmful in respect of duct durability, the air control dampers shall be made of building materials which can withstand these conditions.

5.4.3 Installation

Air control dampers shall be installed in a way their position can be seen.

5.4.4 Commissioning

Dampers position shall be checked and a complete open-close test shall begin.

5.4.5 Maintenance – Routine

Dampers position shall be checked.

See EN 12097.

5.5 Duct

5.5.1 Component

Materials for walls in ventilation ducts shall be selected so that the ducts can withstand the functions they are exposed to, such as heat and cleaning.

The duct used for ventilation only, when required by local requirements, shall fulfil EN 12237, EN 13501-1, EN 13501-3, EN 1366-1, EN 1505, EN 1506 and EN 1507.

If the duct is used for ventilation and fire/smoke exhaust, ducts shall fulfil EN 1366-8, EN 1366-9, EN 13501-4 and EN 12101-7.

If the duct is insulated, the insulation materials shall have a classification for fire reaction as given in EN 13501-1.

Non-metallic ducts shall be in accordance with EN 13403.

If suspended ceilings/raised floors are used as air ducts, they shall meet the requirements of EN 1364-2 and EN 13964.

5.5.2 Installation

Fire resistant ventilation ducts shall be fixed and supported in accordance with the fire test in accordance with EN 1366-1.

All electrical equipment or cables with the purpose of power supply (low voltage cables) shall not be installed in ventilation ducts due to danger of ignition and the possibility of generating and spreading combustion gases.

NOTE Cables intended for measurement are not concerned.

5.5.3 Commissioning

See Clause 6.

5.5.4 Maintenance – routine

See EN 12097.

5.6 Fire dampers and smoke control dampers

5.6.1 General

This subclause applies to dampers intended to react in fire situation, or for smoke and heat exhaust. These dampers shall comply with prEN 15650.

5.6.2 Component

Fire dampers shall be tested in accordance with EN 1366-2 and classified in accordance with EN 13501-3.
Leakage rated fire dampers shall be tested in accordance with EN 1366-2 and classified in accordance with EN 13501-3.

NOTE 1 Fire dampers generally selected so that they meet the requirements for the fire-resistance period of the fire-separating building elements penetrated by the ducts.

A smoke control damper shall comply with prEN 12101-8 for smoke purposes. Smoke control dampers shall be tested in accordance with prEN 1366-10 and classified using EN 13501-4.

NOTE 2 Smoke control dampers are generally selected so that they meet the requirements for the fire-resistance period of the fire-separating building elements penetrated by the ducts or the duct surface to which they are to be associated.

5.6.3 Installation

A fire damper or smoke control damper shall be installed as prescribed by the manufacturer and in accordance with the tests so that its performance meets the fire-resistance period or smoke control required.

The sealing between the damper and the building structure shall be made in such a way that it does not reduce the fire resistance of the structure and shall be in conformity with the initial fire tests.

A fire damper shall be installed according to the initial fire tests.

5.6.4 Commissioning

The dampers shall be checked in accordance with local requirements and the following shall be assessed:

— product is appropriate for its purpose and according to the design specification;

— product is installed according to manufacturer's instruction;

— functioning of the mechanism is tested;

— installation certificate with appropriate signature in accordance with local requirements is included in the documentation.

5.6.5 Maintenance – routine

Cycle of routine tests concerning all fire dampers and smoke control dampers (SCD) shall be in accordance with local requirements. For example of routine tests, see Annex C.

A routine test is a mechanical test to activate fire dampers from its waiting position to its fire safety position and back to its waiting position.

Maintenance of fire dampers shall be in accordance with EN 12097.

5.7 Air terminal devices

5.7.1 Component

According to local regulations.

5.7.2 Installation

According to manufacturer's instructions.

5.7.3 Commissioning

Flow direction, air velocity, pressure drop.

5.7.4 Maintenance – routine

Flow, velocity, noise, cleaning shall be checked in accordance with maintenance procedures of the air distribution system.

5.8 Anchors and supports

5.8.1 General

Fire resistant ventilation ducts shall be fixed and supported in conformity with initial fire tests so that, in the situation of a fire occurring, they remain in place for the minimum fire-resistance period required.

5.8.2 Component

Anchors and supports shall be made of non combustible material. Isolation materials used for non-transmission of noise and vibration shall be in accordance with local requirements (fire reaction classification, etc.).

5.8.3 Installation

Installation shall be in conformity with test reports.

5.8.4 Commissioning

Check if installation is in conformity with test reports.

5.8.5 Maintenance – routine

No requirement is needed for maintenance.

5.9 Duct fittings

5.9.1 Component

Duct fittings shall be in accordance with the relevant standards. For example, metal ducts shall be in accordance with EN 1505 and EN 1506.

NOTE Duct fittings are usually made of the same material as the ducts.

5.9.2 Installation

According to manufacturer's instructions.

5.9.3 Commissioning

Check if installation has been carried out according to the manufacturer's instructions.

5.9.4 Maintenance - routine

See EN 12097.

5.10 Control panels

Control panels used in dual purpose ventilation systems shall be in accordance with prEN 12101-9.

5.11 Cables and connections

5.11.1 Component

Cables and connections shall be fire resistant or fire protected, in accordance with local requirements, if they serve components that need electricity in a fire situation.

NOTE Cables and connections which generate a few toxic gases in a fire situation should be preferred.

5.11.2 Installation

All electrical equipment or cables shall not be installed in ventilation ducts due to danger of ignition and generation and spreading of combustion gases.

The fire protection of electricity supply for components is intended to act in a fire situation shall be checked.

NOTE Cables intended for measurement are not concerned.

5.11.3 Maintenance – routine

Components used in fire safety purposes should be periodically activated to check the integrity of electrical supply.

5.12 Air handling units

5.12.1 Component

Air handling unit shall be in accordance with EN 1886 and in particular, Clause 10 of EN 1886:2007 for fire protection.

5.12.2 Installation

The following installations, for example, are recommended in order to prevent the spread of fire:

— units installed in a fire classified plant room; distance of the supply and exhaust air openings to the nearest unclassified part of construction more than 4 m;

— units installed in a separate plant room separated from the ductwork by a fire damper;

— units installed in the air distribution system as a part of the ductwork, both sides separated from the ducts by fire dampers;

— units installed in the air distribution system as a part of the ductwork, for fire class inside a casing assembled of fire classified panels or ductwork components. In this case, the casing shall be equipped with access doors of at least the same fire class as the unit casing.

The inlet and outlet openings of an air handling unit shall normally be connected to ductwork, the inlet opening of which often has an air intake opening in the building envelope.

Generally, if the fans of the air handling units are acting in a fire situation, they shall by-pass the air filters, heat recovery units, etc.

5.12.3 Commissioning

See EN 13053.

5.12.4 Maintenance – routine

See EN 13053.

A complete cleaning of the air handling unit shall be carried out to avoid concentration of dust deposits.

5.13 Air filters

5.13.1 Component

Air filters can be integrated in air handling units or air terminal devices, or installed as a ductwork component.

The materials of air filters shall have a classification for fire reaction as given in EN 13501-1. Marginal quantities of auxiliary substances, e.g. duct sealant, can be allowable without classification for fire reaction. Air filters shall be made in such a way that they will not increase the hazard of spreading fire and smoke gases in the case of fire. The materials used in buildings, air distribution systems and their components shall not contribute to the development of fire in a hazardous manner.

5.13.2 Installation (system design)

In systems intended for both ventilation and smoke extraction, the design of the air filter shall take into account both purposes in such a way that it does not limit the performance of the fan during a smoke extraction situation.

It is recommended to:

— install a by pass system of the filters;

— install a system checking pressure loss in the filters.

Easy access for changing the air filter shall be provided, in accordance with EN 12097.

5.13.3 Commissioning

Testing the functioning of the pressure loss system.

Testing the functioning of the possible bypass system.

5.13.4 Maintenance – routine

Air filters may require more frequent maintenance, usually changing the air filter, than other parts of the system (e.g. ductwork) in accordance with EN 13779.

NOTE 1 The interval for inspection and maintenance depends on the contaminant level of the air entering the system. (For example, extract air systems in professional kitchens etc. require more frequent maintenance).

NOTE 2 Maintenance frequency depends on:

— information given by pressure loss checking system;

— requirements from national regulations, if any.

5.14 Sound attenuators

5.14.1 Component

Sound attenuators can be integrated in air handling units or air terminal devices, or installed as a ductwork component.

The materials of sound attenuators shall have a classification for fire reaction as given in EN 13501-1. Marginal quantities of auxiliary substances, e.g. duct sealant, can be allowable without classification for fire reaction. Sound attenuators shall be made in such a way that in the event of fire, they will not increase the hazard of spreading fire and smoke gases. The materials used in buildings, air distribution systems and their components shall not contribute to the development of fire in a hazardous manner.

5.14.2 Installation (system design)

In systems intended for both ventilation and smoke extraction, the design of the sound attenuator shall take into account both purposes in such a way that it does not limit the performance of the fan during smoke extraction situation. If there is a risk for limiting performance of the smoke extraction fan, a bypass system is recommended.

Easy access for cleaning or changing the sound attenuator shall be provided, in accordance with EN 12097.

5.15 Heat exchangers

5.15.1 Component

Heat exchangers can be integrated into air handling units or air terminal devices, or installed as a ductwork component.

The materials of heat exchangers shall have a classification for fire reaction as given in EN 13501-1. Marginal quantities of auxiliary substances, e.g. duct sealant, can be allowed without classification for fire reaction.

5.15.2 Installation

In systems intended for both ventilation and smoke extraction, the design of the heat exchangers shall take into account both purposes in such a way, that it does not limit the performance of the fan during smoke extraction situation. If there is a risk for limiting the performance of the smoke extraction fan, a bypass system is recommended.

Easy access for cleaning or changing the heat exchangers shall be provided, in accordance with EN 12097.

6 Commissioning and maintenance of air distribution systems

In addition to the commissioning and maintenance requirements described in clause 5, the following installation, commissioning and maintenance information shall be provided for the air distribution system:

— commissioning and maintenance procedures, including tests and measurements for the system and each component;

— frequency of regular checks and maintenance;

— drawings including the location and access routes to components that need regular checking and maintenance;

— list of documents related to commissioning and maintenance.

It is recommended that the air distribution systems should be cleaned for safety and hygienic purposes according to National requirements and the type of installation. Cleaning should be synchronised with the above mentioned procedures.

Intervals for different service and maintenance measures shall be included in the documentation.

Inspection and maintenance should be included in the documentation and recorded in the operations register according to National regulations.

7 Marking, labelling and product information

Components such as fans, fire dampers etc. shall be marked according to the relevant European Standard (see Annex B) with at least the following information:

— name and trade mark of the supplier;

— type and model of the component;

— product characteristics relevant to fire precautions, including class and reference to the relevant European Standard (according to clause 5 and Annex B);

— identification number of the component according to the documentation;

— date of manufacture.

Inspection and cleaning panels, fire dampers and other specific components shall be provided with permanent labels, indicating the location of the component.

Annex A
(informative)

Checklist for components

Table A.1

		Component	Installation (System design)	Commissioning	Maintenance - Routine
Inlet/Outlet Louvers		since outside the building, no requirement	minimum distance between inlet and outlet to avoid recirculation	check conformity with regulations	visual check of the free area
Fans not submitted to smoke	ventilation only	no requirement	to be stopped in case of fire	check the function is active	check the function is active
	ventilation + assistance in case of fire	priority to the safety function airflow	- to be activated or reactivated in case of fire - electrical wiring to be fire protected - connected to control panel according to regulation	- ensure proper safety function - check protection - check connection	- check the function is active - check protection - visual check of the connection - visual check of the free area
Fans submitted to smoke	ventilation + exhaust smoke	tested according to EN 12101-3 priority to the safety function (airflow)	- to be activated or reactivated in case of fire - wiring to be fire protected - connected to control panel according to regulation	- ensure proper safety function - check protection - check connection	- check the function is active - check protection - visual check of the connection - visual check of the free area

(continued)

Table A.1 *(concluded)*

		Component	Installation (System design)	Commissioning	Maintenance - Routine
filters		not applicable	see EN 12097 for access		replace and check dirty filters in order to avoid fire spread NOTE 1 automatic checking use is suggested.
Air control dampers		general recommendation based on fire protection regulations see also EN 13501-1	see EN 12097 for access	dampers position to be checked NOTE it is suggested to use complete functions (dampers + actuator)	dampers position to be checked
Ductwork	ventilation only	EN 13501-1 and EN 13501-3 and EN 1366-1	- ductwork fire resistance should be ≥ to wall fire resistance - fire risk analysis determine the prescription to ductwork material	Manufacturer's instructions	EN 12097
	combined use (fire and smoke)	EN 13501-4, EN 1366-8, EN 1367-9	- ductwork fire resistance should be ≥ to wall fire resistance - fire risk analysis determine the prescription to ductwork material	Manufacturer's instructions	EN 12097
Fire control dampers		EN 13501-3 and EN 1366-2	According to the documentation	Automatically tested if available	
Air terminal devices		EN12589, EN 12239 and EN 12238	According to the manufacturer's instructions	Flow direction, air velocity, pressure drop	Flow, velocity, noise, cleaning in accordance with maintenance procedures of the air distribution system
Air handling units		See 5.13	See 5.13	EN 13053	EN 13053
Air filters		See 5.14	See 5.14		checked and replaced when dirty
NOTE 2 Listed standards apply when requested.					

Annex B

(informative)

Table of components/characteristics European Standards

Table B.1

Component	Fire resistance	Ability of thermal device	Fire reaction	Mechanical strength	Precaution for installation	Tightness	Stop function	Aerodynamic testing	Maintenance including cleaning routine test
Inlet/outlet louvres	X[a]	X [a]	X [a]	EN 1751	EN 13030	X [a]	X [a]	EN 1751	EN 12097
Fans	X [a]	X [a]	X [a]	EN 1886	EN 13053	EN 1886	X [a]	ISO 5801	EN 12097
Fans **Combined use (F&S)**	EN 12101-3 EN 13501-4	X [a]	X [a]	EN 1886	EN 12097 prEN 12101-4	EN 1886	X [a]	ISO 5801	EN 12097 prEN 12101-4
Air control dampers	EN 1363-1	X [a]	X [a]	EN 1751	EN 12097	EN 1751	EN 1751	EN 1751	EN 12097
Duct for ventilation only	EN 1366-1 EN 13501-3	X [a]	X [a]	EN 1507 EN 12237	EN 12097	EN 1507 EN 12237	X [a]	X [a]	EN 12097
Duct for combined use (F & S)	EN 1366-8 EN 1366-9 EN 13501-4	X [a]	X [a]	EN 1507 EN 12237	prEN 12101-4 EN 12097	EN 1507 EN 12237	X [a]	X [a]	EN 12097
Flexible ducts	EN 1366-1 EN 13501-3	X [a]	X [a]	EN 13180	EN 12097	EN 13180	X [a]	X [a]	EN 12097
Fire dampers	EN 1366-2 EN 13501-3 prEN 15650	ISO 10294-4 prEN 15650	X [a]	EN 1751 EN 12237	EN 12097 prEN 15650	EN 1751	prEN 12101-8	EN 1751	EN 12097
Smoke control dampers (SCD)	prEN 12101-8 prEN 1366-10 E N 13501-4	X [a]	X [a]	X [a]	EN 12097	EN 1751	prEN 12101-8	EN 1751	EN 12097
Multi-purpose **SCD**	prEN 12101-8 prEN 1366-10 EN 13501-4	X [a]	X [a]	EN 1751	EN 12097	EN 1751	EN 1751	EN 1751	EN 12097

(continued)

Table B.1 *(concluded)*

Component	Fire resistance	Ability of thermal device	Fire reaction	Mechanical strength	Precaution for installation	Tightness	Stop function	Aerodynamic testing	Maintenance including cleaning routine test
Air terminal devices	EN 1363-1	X [a]	EN 13501-1 EN ISO 1182 or EN ISO 1716 and EN 13823	X [a]	X [a]	EN 1507 EN12237	X [a]	EN 12238 and EN 12239	EN 12097
Supports	EN 1366-1 EN 1366-8 EN 1366-9	X [a]	EN 13501-1	EN 12236	EN 1366-1 EN 1366-8 EN 1366-9	X [a]	X [a]	X [a]	EN 12097
Expansion joints	EN 1363-1	X [a]	EN 13501-1	X [a]	X [a]	EN 1507 EN 12237	X [a]	X [a]	EN 12097
Electrical cables and wiring	EN 13501-3	X [a]	EN 13501-1	X [a]	X [a]	X [a]	X [a]	X [a]	EN 12097
Air handling units	X [a]	X [a]	EN 13501-1	EN 1886	EN 13053	EN 1886	X [a]	EN 13053	EN 12097 EN 13053
Air handling units combined use (F § S)	EN 12101-3 EN 13501-4	X [a]	EN 13501-1	EN 1886	EN 13053	EN 1886	X [a]	EN 13053	EN 12097 EN 13053
Filters	X [a]	X [a]	EN 13501-1	X [a]	EN 12097	X [a]	X [a]	EN 779	EN 12097
Sound attenuators	X [a]	X [a]	EN 13501-1	EN 1507 EN 12237	X [a]	EN 1507 EN 12237	X [a]	EN 1751	EN 12097

[a] x no function.

Annex C
(informative)

Maintenance for fire dampers and smoke control dampers

Table C.1 — Example of routine tests for fire dampers

Damper Reference	
Date of inspection	
Check damper installation for any deterioration of the fire stopping material on both sides of the barrier. This inspection should include all external supports which may form part of the damper installation.	
Check actuator wiring for damage (where applicable).	
Check end-switch wiring for damage (where applicable).	
Check damper cleanliness and clean where necessary.	
Check the condition of blades and seals, rectify and report where necessary.	
Confirm the safety closure operation of the fire damper according to the manufacturer's instructions.	
Confirm operation of damper to OPEN and CLOSE by use of the control system and physical observation of the damper, rectify and report where necessary.	
Confirm operation of OPEN and CLOSED end-switches, rectify and report (where necessary).	
Confirm that the damper fulfils its function as part of the control system (where necessary).	
Confirm that the damper is left in its normal working position.	

Table C.2 — Example of routine tests for smoke control dampers

Damper Reference	
Date of inspection	
Check damper installation for any deterioration of the fire stopping material on both sides of the barrier. This inspection should include all external supports which may form part of the damper installation.	
Check actuator wiring for damage.	
Check end-switch wiring for damage.	
Check damper cleanliness and clean where necessary.	
Check the condition of blades and seals, rectify and report where necessary.	
Confirm operation of damper to OPEN (within 60 s) and CLOSE (within 60 s) by use of the control system and physical observation of the damper, rectify and report where necessary.	
Confirm operation of OPEN and CLOSED end-switches, rectify and report where necessary.	
Confirm that the damper fulfils its function as part of the smoke control system.	
Confirm that the damper is left in its standby position.	

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[5] prEN 12101-4, *Smoke and heat control systems - Part 4: Fire and smoke control installations – Kits*

[6] EN 12236, *Ventilation for buildings - Ductwork hangers and supports - Requirements for strength*

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[14] ISO 10294-4, *Fire resistance tests - Fire dampers for air distribution systems - Part 4: Test of thermal release mechanism*

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