BS EN 15882-2:2015

BSI Standards Publication

Extended application of results from fire resistance tests for service installations

Part 2: Fire dampers

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National foreword

This British Standard is the UK implementation of EN 15882-2:2015.

The UK participation in its preparation was entrusted to Technical Committee FSH/22/-/4, Fire resistance tests for dampers, seals and smoke extraction.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Application étendue des résultats des essais de résistance au feu des installations de service - Partie 2 : Clapets résistant au feu

Erweiterter Anwendungsbereich der Ergebnisse aus Feuerwiderstandsprüfungen für Installationen - Teil 2: Brandschutzklappen

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

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Contents

Page

Foreword

This document (EN 15882-2:2015) 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of an identical text or by endorsement, at the latest by October 2015 and conflicting national standards shall be withdrawn at the latest by October 2015.

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.

EN 15882, *Extended application of results from fire resistance tests for service installations* consists of the following parts:

— *Part 1: Ducts*

— *Part 2: Fire dampers*

— *Part 3: Penetration seals*

— *Part 4: Linear joint seals*

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

Introduction

It should be noted that fire-resisting dampers are special products that are exposed to different conditions to other elements of construction; in particular they are subjected to significantly different pressure regimes. Also, integrity is evaluated by leakage measurements. Consequently, this European Standard may adopt a different approach to other extended field of application standards, with more emphasis on testing.

1 Scope

This European Standard provides guidance and rules to notified bodies (for fire dampers) to allow them to produce/validate an extended field of application report for fire dampers. This standard identifies the parameters that affect the fire resistance of dampers. It also identifies the factors that need to be considered when deciding whether, or by how much, the parameter can be extended when contemplating the fire resistance performance of an untested, or untestable variation in the construction.

This European Standard explains the principles behind how a conclusion on the influence of specific parameters/constructional details relating to the relevant criteria (E,I,S) can be achieved.

This European Standard does not cover dampers used for smoke control.

This European Standard only applies to extended fields of application based on tests successfully undertaken to EN 1366-2. Only test reports that have a total test time where the criteria are fulfilled that is in excess of the required classification period by a margin of either 10 % or 12 min, whichever is the least, are to be considered. Each classification (E,I,S) is to be considered individually – consequently E (134 min achieved) may be extended, but EI (61 min achieved) may not be extended for a classification of EI60.

Additionally, leakage determined during such tests is to be at least 10 % below the leakage limits for E, or for E-S, dependent on classification achieved, given in EN 13501-3 before the EXAP rules can be applied. The 10 % below the leakage limits is to be fulfilled for the extended period in addition to the classification period.

By application of this European Standard, it should be possible to identify what specifications should be tested to maximize the field of application. Some information on test programmes is given for guidance purposes.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 1366-1:2014, *Fire resistance tests for service installations - Part 1: Ventilation ducts*

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

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 15882-1, *Extended application of results from fire resistance tests for service installations - Part 1: Ducts*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1363-1 and EN 1366-2 and the following apply.

3.1
multiple section assemblies
assemblies of individual damper units to form larger units

3.2
horizontal orientation of damper
position of the damper mounted horizontally

EXAMPLE When installed in the plane of a floor or a ceiling.

3.3
vertical orientation of damper
position of the damper mounted vertically, e.g. when installed in the plane of a wall

3.4
supporting construction
construction used as part of the test assembly to support the test specimen and to fill in the furnace aperture

3.5
standard supporting construction
supporting construction that has known fire behaviour and for which a Direct Field of Application has been established

4 Determination of worst case

In certain circumstances a rule can call for a new test to be undertaken. To avoid having to re-test everything, a determination shall be made of 'worst case'.

Firstly consider the classification required: E, EI, E-S, EI-S. Consider all the test reports that give the required classification.

Determine which criteria failed first in each test. The resulting 'worst case' will be the one where the time to failure of each and any of the parameters was the lowest.

If the test periods show that none of the criteria failed before the classification period plus 10 % or 12 min, then the supporting construction shall be considered. The worst case shall be with the fire damper mounted in the lightest construction in terms of mechanical stability. The sponsor may pick a heavier supporting construction, but then any extended field of applications shall only apply to this supporting construction and those heavier and more dense as per direct field of application.

The method of determination of worst case and the related extended fields of application shall be reported in the extended field of application report.

5 Conditions and application rules

5.1 Change of fixing damper to supporting construction

a) No change in the location of the fixings relative to the damper and the supporting construction shall be permitted. The pitch between the fixings shall not be increased.

b) Alternative fixings may be used if their performance is proven by fire test, stress, linear expansion and loading information data. Any other information available may be considered.

c) Any alternative fixings shall be included as part of the extended field of application report.

d) Hanger and relating anchor information shall be assessed in accordance with EN 15882-1.

5.2 Multiple damper assemblies

5.2.1 E Classification only

5.2.1.1 Method

To allow the use of multiple assemblies of E classified fire dampers, either side by side or on top of each other, the following test shall be performed. An assembly consisting of fire dampers that have already successfully gained a classification conforming to EN 13501-3 shall be made and installed into a supporting construction using the proposed method.

A fire damper selected using the worst case method in accordance with Clause 4 shall be made into an assembly as shown in Figure 1. This will allow the other EXAP rules from the tables which follow to apply to multi-section units, as they do to single section units.

The unit to be tested shall be constructed so as to be made up of at least four sections and shall have a maximum overall size of 2 600 mm × 2 600 mm. This is to allow for a small gap around the outside of the damper and a minimum span of supporting construction of 200 mm all round. See Figure 1 which is applicable to both vertical (shown) and horizontal test installations.

The test method shall be generally as EN 1366-2 (note: also refer to intumescent fire damper test, if this becomes relevant), but instead of a closed plenum with a fan, an extended open duct 1 m long shall be fixed to the dampers.

The plate thermometers for control of furnace temperature shall be placed at the centre of area of each fire damper section.

Leakage shall not be measured. A 300 Pa differential pressure shall not be set across the unit.

The criteria used shall be the integrity at all of the following:

— round the joint between the damper installation and the supporting construction;

— any point within the damper assembly, (joints, blades, etc.);

— sustained flaming at any point around the perimeter or at the blades or joints.

If the individual fire damper sections do not close within the first 90 s, provision shall be made to manually close the sections after 2 min (air may be drawn into the bottom of the furnace having a cooling effect). Wire thermocouples shall be placed at each thermal sensing element for information purposes. This information shall be recorded.

Classification will be as the original single section units with regard to the E classification as long as the above integrity criteria are fulfilled.

5.2.1.2 Field of application

If, due to the size restriction of 2 600 mm × 2 600 mm, the assembly is made up of four individual units which are smaller than or of the same size as the original single unit tested, assemblies for application may be made of units up to the single unit size tested.

EXAMPLE 1 An assembly of four units with an overall size of 2 600 mm × 2 600 mm, made from individual units with overall size 1 300 mm × 1 300 mm, representing a single section size tested of 1 500 mm × 1 300 mm, allows an assembly of overall size 3 000 mm × 2 600 mm to be used.

If the assembly is made up of four or more units, leading to whatever overall size, the size of unit to be used shall have been tested previously as a single unit. For application, the units then used to make up assemblies shall not exceed the size of the units tested as part of the assembly. This test may not be used to allow larger units to be back assessed to single sections for classification to EN 13501-3:

EXAMPLE 2 An assembly of 6 units of individual overall size 600 mm × 600 mm, giving an assembly size of 1 200 mm × 1 800 mm, allows the use of multiple assemblies of units of individual size 600 mm × 600 mm.

If the individual unit tested was 1 000 mm × 1 000 mm, the use of this to build assemblies is not now permitted as this could have been assembled to form a unit 2 000 mm × 2 000 mm, which could be tested (i.e. is less than 2 600 mm × 2 600 mm).

If the 600 mm × 600 mm size has not been tested individually and only a 500 mm × 500 mm unit has been tested previously, this is not permitted and back assessment of the 500 mm × 500 mm is also not permitted as there is no pressure differential in this EXAP test.

For dampers tested following these directions, the standard direct field of application from EN 1366-2 shall apply.

All details with respect to multiple damper assemblies, the installation methods and their associated testing, and any direct field of application and further EXAP, shall be included in the extended application report.

Using the information ascertained above, larger assemblies of individual dampers are permitted, providing that they are also structurally supported to a fire-safe design provided by competent structural engineers.

5.2.2 EI, E-S, EI-S Classifications

5.2.2.1 Method

Make a multiple assembly, fit a single connecting duct to the whole assembly and perform the complete test in accordance with EN 1366-2. Classify the assembly in accordance with EN 13501-3. Horizontal and vertical tests are required if each application is to be used.

5.2.2.2 Field of application

Having done the above test(s) the results may be applicable to dampers extended on the width only. Larger assemblies of individual dampers shall be structurally supported to a fire-safe design provided by competent structural engineers.

5.3 Alternative penetration seals

Alternative penetration seals shall be tested in association with a fire damper in accordance with EN 1366-2, with the following exception:

Tested standard mortar may be replaced by fire resisting refractory mortars with relevant test evidence with regard to fill and supporting distance.

6 Influence of parameters and factors on fire damper performance

This standard takes into account the parameters and factors that can affect the fire resistance performance of fire resisting dampers when tested in accordance with the method of test in EN 1366-2. These have been listed in Table 1 to Table 4.

The influence on integrity, insulation and, where appropriate, smoke leakage, shall be evaluated in accordance with the clauses and tables in this standard.

The parameters and factors of the anticipated influence on damper performance are specified in Table 1 to Table 4.

Consideration of the parameters and factors in Clause 7 have led to the development of the rules in Clause 8, which state whether any conclusions may be drawn or a requirement for further testing, whichever is relevant.

7 Critical parameters and factors

7.1 General

The following parameters and factors are considered to affect the fire resistance performance of a fire damper and shall be taken into account when determining the field of extended application.

7.2 Common operational parameters and factors

Table 1 — Common operational parameters and factors

Line	Parameter and rule reference	Factor
1	Fire exposure	Exposed or not exposed
2	Changes in pressure (positive or negative)	Lower or higher

7.3 Constructional parameters

Table 2 — Constructional parameters

Line	Parameter	Factor
1	Change in location of damper blade according to the housing	Closer or further from exposed flange
2	Change in axis position according to the housing	Horizontal or vertical or any angle
3	Change in location of temperature sensing element	Lower or higher from horizontal center plane, further or closer (to fire), in front or behind damper blade
4	Change in location of actuating mechanism and actuator	Fully exposed, partially exposed (in the wall/floor) or fully non-exposed
5	Change in geometrical shape	Rectangular to circular or oval or vice versa
6	Change in height of cross section	Greater or less than tested
7	Change in width of cross section	Greater or less than tested
8	Change in height/width aspect ratio	Greater or less than tested
9	Change in diameter of cross section	Greater or less than tested
10	Change in length of damper housing	Greater or less than tested
11	Change in number of blades (multi-blade dampers)	More or less than tested

7.4 Parameters of components of damper

Table 3 — Parameters of components of damper

Line	Parameter	Factor
1	Change in actuating mechanism	Change of type
2	Change in actuator	Change of type and operating time
3	Change in connection flange	Change of material, Change of shape and dimensions
4	Change in temperature sensing element	Change of type, material and release temperature
5	Change in material of damper blade	Change of material
6	Change in material of damper housing	Change of material
7	Change in insulating material of damper housing	Change of material
8	Change in insulating material of damper blade	Change of material
9	Change in thickness of damper blade	Greater or less than tested
10	Change in thickness of damper housing	Greater or less than tested
11	Change in retaining profile/ stop	Change of material, Change of shape and dimensions
12	Change in the intumescent materials used in the construction of the damper	Change of material Change of shape and dimensions
13	Change in cold seal material	Change of material Change of shape and dimensions

7.5 Installing parameters

Table 4 — Installing parameters

Line	Parameter	Factor
1	Change in wall/floor type	Rigid or flexible constructions
2	Change in wall/floor thickness	Greater or lower
3	Change in the location of the damper within the supporting construction (damper built into the supporting construction)	Closer or further from the un-exposed surface of the supporting construction
4	Change in distance of the damper from the supporting construction (damper mounted on the outside of the supporting construction or away from it)	Closer or further from the un-exposed surface of the supporting construction
5	Change in suspension (hangers, bearers, anchors) of the damper and/or the connection duct	Length Tensile stress Position Hanger protection and arrangement Type of anchors
5	Change in location of the damper blade according to the supporting construction	Closer or further from the center plane of the supporting construction
6	Change in gap size between damper housing and supporting construction	Greater or less than tested
7	Change in depth of penetration seal	Greater or less than tested
8	Change in material of penetration seal	Type of penetration seal materials
9	Change in axis orientation	Horizontal or vertical or any angle
10	Change in damper orientation	Horizontal or vertical or sloping
11	Change in fixations	Number, type, distance, length of fixings
12	Change in spacing between dampers	Greater or less
13	Change in distance between fire damper and a construction element (wall/floor)	Greater or less

8 Methodology

Table 5 — Rules

Rule	Parameter	Factors	Factor influence on criteria			
Reference			Integrity (E)	Insulation (I)	Smoke Leakage (S)	Rules
X.1	Fire exposure	Exposed or not exposed	See rule	See rule	See rule	Test in accordance with EN 1366-2 for all those applications referred to Use worst case to allow further EXAP
X.2	Changes in pressure (positive or negative)	Increased under pressure $\|\Delta P\| > \|\Delta P_{tested}\|$	Worse[-E]	Worse[-I]	Worse[-S]	Additional test necessary, test in accordance with EN 1366-2
X.3		Decreased under pressure $\|\Delta P\| < \|\Delta P_{tested}\|$	OK[=/+E]	OK[=/+I]	OK[=/+S]	Assume that classification will be maintained.
X.4		Increased over pressure	Worse[-E]	Worse[-I]	Worse[-S]	Under-pressure tested to -300 Pa suitable for up +300 Pa Otherwise need to test a) any other under-pressure greater than or equal to -500 Pa suitable for up +500 Pa e.g. -500 Pa suitable for up to +500 Pa -1000 Pa suitable for up to +500 Pa etc. b) Any overpressures required shall be tested using an under-pressure that is 500 Pa greater than the over pressure required. The classification leakage values shall be maintained at 200 $m^3/hr/m^2$ and 360 $m^3/hr/m^2$ respectively.
X.5		Decreased over pressure	OK[=/+E]	OK[=/+I]	OK[=/+S]	Covered by above

Rule	Parameter	Factors	Factor influence on criteria			
X.6	Change in location of damper blade within the housing	Closer or further from exposed flange	See rule	See rule	See rule	Additional test necessary if damper blade position does not move closer or further from the un-exposed surface of the supporting construction. Use worst case to allow further EXAP
X.7	Change in axis position within the housing	Horizontal or vertical or any angle	See rule	See rule	See rule	Additional test necessary, see EN 1366-2 Use worst case to allow further EXAP
X.8	Change in location of temperature sensing element	Lower or behind damper blade	Worse[-E]	Worse[-I]	Worse[-S]	Additional test necessary, see EN 1366-2 Use worst case to allow further EXAP
X.9		Higher from horizontal center plane	OK[=/+E]	OK[=/+I]	OK[=/+S]	Assume that classification will be maintained.
X.10		Further from exposed side	Worse[-E]	Worse[-I]	Worse[-S]	Additional test necessary, see EN 1366-2 Use worst case to allow further EXAP
X.11		Closer to exposed side	OK[=/+E]	OK[=/+I]	OK[=/+S]	Assume that classification will be maintained.
X.12	Change in location of actuating mechanism and actuator	Wherever placed	See rule	See rule	See rule	Additional test necessary, see EN 1366-2 Use worst case to allow further EXAP
X.13	Change in geometrical shape	Rectangular to circular or oval or vice versa	See rule	See rule	See rule	Additional test necessary, see EN 1366-2 Use worst case to allow further EXAP
X.14	Change in height of cross section	Greater or less than tested	See rule	See rule	See rule	Covered by EN 1366-2, shall test largest dimension Use worst case to allow further EXAP
X.15	Change in width of cross section	Greater or less than tested	See rule	See rule	See rule	Covered by EN 1366-2, shall test largest dimension Use worst case to allow further EXAP
X.16	Change in height/width aspect ratio	Greater or less than tested	See rule	See rule	See rule	Covered by EN 1366-2, shall test largest dimension Use worst case to allow further EXAP

Rule	Parameter	Factors	Factor influence on criteria			
X.17	Change in diameter of cross section	Greater or less than tested	See rule	See rule	See rule	Covered by EN 1366-2, shall test largest dimension Use worst case to allow further EXAP
X.18	Change in length of damper housing	Greater than tested	OK[=/+E]	OK[=/+I]	OK[=/+S]	Assume that classification will be maintained
		Less than tested	See rule	See rule	See rule	Un-insulated casing – assume classification maintained Insulated casing – re-test to EN 1366-2
X.19	Change in number of blades (multi-blade dampers) – blade pitch	More than tested	See rule	See rule	See rule	Design change – re-test
X.20		Less than tested	See rule	See rule	See rule	Design change – re-test
X.21	Change in actuating mechanism	Change of type	See rule	See rule	See rule	Perform at least one test in accordance with EN 1366-2 with the thermal release/actuating mechanism mounted on the un-exposed side of the damper and perform at least one test in accordance with EN 1366-2 with the thermal release/actuating mechanism mounted on the exposed side of the damper. This is required for both vertical and horizontal orientations. If vertical axis and horizontal axis are to be supplied for vertical installation, then both shall be tested inside and outside the furnace. Having been successful in these two tests, then this result will be applicable such that the thermal release mechanism/operating system may be used on dampers where other tests on the same damper have been undertaken. The temperature sensing element shall be as tested or in accordance with rule X.25 and not be fitted below the position in which the original was tested Use worst case to allow further EXAP
X.22	Change in actuator	Change of type and operating time	See rule	See rule	See rule	Perform at least one test in accordance with EN 1366-2 with actuator mounted on the un-exposed side of the damper and perform at least one test in accordance with EN 1366-2 with the actuator mounted on the exposed side of the damper.

Rule	Parameter	Factors	Factor influence on criteria			
						Having been successful in these two tests, then this result will be applicable such that the actuator may be used on dampers where other tests on the same damper have been undertaken. The temperature sensing element shall be as tested or in accordance with rule X.25 and not be fitted below the position in which the original was tested. Use worst case to allow further EXAP
X.23	Change in duct connection flange	Change of material and/or change of shape or dimensions	OK[=/+E]	OK[=/+I]	OK[=/+S]	Assume that classification will be maintained.
X.24	Change in wall connection flange	Change of material and/or change of shape or dimensions	See rule	See rule	See rule	Additional test necessary, see EN 1366-2 Use worst case to allow further EXAP
X.25	Change in temperature sensing element	Change of type, material and release temperature Change in activation time	See rule	See rule	See rule	For temperature sensing elements with a higher temperature: perform at least one test in accordance with EN 1366-2 with the temperature sensing element mounted on the un-exposed side of the damper. Having been successful in one test, then this result will be applicable such that higher temperature sensing elements may be used on dampers where other tests on the same damper have been undertaken. The thermal sensing element shall not be fitted below the position in which it was tested. Use worst case to allow further EXAP
						For temperature sensing elements with a higher (or lower) temperature: Evaluate to ISO 10294-4. The thermal sensing element shall not be fitted below the position in which it was tested. Use worst case to allow further EXAP

Rule	Parameter	Factors	Factor influence on criteria			
X.26	Change in material of damper blade	Change of material	See rule	See rule	See rule	If any different materials are used (e.g. board materials, intumescent products), assume that it is a different product and re-test, with the following exceptions: If galvanized steel has been tested, stainless steel grades are accepted as direct replacements without further testing, provided the same shapes and thicknesses are used. If a stainless steel grade has been tested, other stainless steel grades of higher specification are accepted as direct replacements without further testing, provided the same shapes and thicknesses are used. Use worst case to allow further EXAP
X.27	Change in material of damper housing	Change of material	See rule	See rule	See rule	If any different materials are used (e.g. board materials, intumescent products), assume that it is a different product and re-test, with the following exceptions: If galvanized steel has been tested, stainless steel grades may be accepted as direct replacements without further testing, provided the same shapes and thicknesses are used. If a stainless steel grade has been tested, other stainless steel grades of higher specification may be accepted as direct replacements without further testing, provided the same shapes and thicknesses are used. Use worst case to allow further EXAP
X.28	Change in insulating material of damper housing	Change of material	See rule	See rule	See rule	If any different materials are used (e.g. board materials, intumescent products), assume that it is a different product and re-test Use the worst case to allow further EXAP
X.29	Change in insulating material of damper blade	Change of material	See rule	See rule	See rule	If any different materials are used (e.g. board materials, intumescent products), assume that it is a different product and re-test Use worst case to allow further EXAP
X.30	Change in thickness of damper blade	Greater or less than tested	See rule	See rule	See rule	Additional test data needed. Use worst case to allow further EXAP

Rule	Parameter	Factors	Factor influence on criteria			
X.31	Change in thickness of damper housing	Greater or less than tested	See rule	See rule	See rule	Additional test data needed. Use worst case to allow further EXAP
X.32	Change in retaining profile/ stop	Change of material, Change of shape and dimensions	See rule	See rule	See rule	Additional test data needed. Use worst case to allow further EXAP
X.33	Change in intumescent material	Change of material Change of shape and dimensions	See rule	See rule	See rule	Additional test necessary, see EN 1366-2 Use worst case to allow further EXAP
X.34	Change in cold seal material	Change of material Change of shape and dimensions	See rule	See rule	See rule	Additional test necessary, see EN 1366-2 Use worst case to allow further EXAP
X.35	Change in wall/floor type	Rigid or flexible constructions	See rule	See rule	See rule	Covered by EN 1366-2, direct field of application or new installation method and therefore re-test
X.36	Change in wall/floor thickness	Greater or lower	See rule	See rule	See rule	Covered by EN 1366-2, direct field of application or new installation method and therefore re-test
X.37	Change in distance of the damper from the supporting construction (built-up on the supporting construction)	Closer to the supporting construction	OK[=/+E]	OK[=/+I]	OK[=/+S]	Assume that classification will be maintained.
X.38		Further from the supporting construction	Worse[-E]	Worse[-I]	Worse[-S]	Increase number of hangers/support calculated in accordance with EN 1366-1:2014, Clause 13.6.
X.39	Change in suspension (hangers, bearers, anchors) of the damper and/or the connection duct	Increased hanger protection	OK[=/+E]	OK[=/+I]	OK[=/+S]	Assume that classification will be maintained.
X.40		Decreased hanger protection	Worse[-E]	Worse[-I]	Worse[-S]	Additional test necessary, see EN 1366-2
X.41		Increased distance between hangers	Worse[-E]	Worse[-I]	Worse[-S]	Additional test necessary, see EN 1366-2

Rule	Parameter	Factors	Factor influence on criteria			
X.42		Decreased distance between hangers	OK[=/+E]	OK[=/+I]	OK[=/+S]	Assume that classification will be maintained
X.43	Change in location of the damper blade according to the supporting construction	Closer to the center plane of the supporting construction	OK[=/+E]	OK[=/+I]	OK[=/+S]	Assume that the classification will be maintained
X.44		Further from the center plane of the supporting construction	See rule	See rule	See rule	Additional test necessary if damper blade position does not move closer or further from the un-exposed surface of the supporting construction. Use worst case to allow further EXAP
X.45	Change in gap between the damper and the supporting construction	Increase in size	See rule	See rule	See rule	Increase in area up to 50 % permitted
X.46		Decrease in size	See rule	See rule	See rule	Decrease permitted where there is sufficient room for installation of the seal.
X.47	Change in depth of penetration seal	Greater than tested	OK[=/+E]	OK[=/+I]	OK[=/+S]	Assume that classification will be maintained.
X.48		Less than tested	Worse[-E]	Worse[-I]	Worse[-S]	Additional test necessary, see EN 1366-2
X.49	Change in material of penetration seal	Type of penetration seal materials	See rule	See rule	See rule	Additional test data needed, see EN 1366-2 with the exception of refractory mortar see 5.3
X.50	Change in axis orientation	Horizontal or vertical or any angle	See rule	See rule	See rule	Perform at least one vertical test in accordance with EN 1366-2 with the blade axis horizontal and perform at least one vertical test in accordance with EN 1366-2 with the blade axis vertical. Use worst case to allow further EXAP
X.51	Change in damper orientation	Horizontal or vertical	See rule	See rule	See rule	Covered by EN 1366-2, perform test in both horizontal and vertical plane
X.52		Sloping	See rule	See rule	See rule	Assume that classification will be maintained if the damper successfully passed a test in both the horizontal and vertical plane

Rule	Parameter	Factors	Factor influence on criteria			
X.53	Change in fixations	Number, type, distance, length of fixings	See rule	See rule	See rule	Additional test data needed
X.54	Change in spacing between dampers	Greater or less than tested	See rule	See rule	See rule	Assume that the classification will be maintained unless the dampers are placed closer together than 200 mm. For closer distance (<200 mm), additional test in accordance with EN 1366-2 is required.
X.55	Change in distance between fire damper and a construction element (wall/floor)	Greater or less, but greater than 75 mm	OK[=/+E]	OK[=/+I]	OK[=/+S]	Assume that the classification will be maintained unless there is insufficient room for installation of the seal – minimum 75 mm – as per DIAP
		Less than 75 mm	See rule	See rule	See rule	Additional test necessary, see EN 1366-2 Use worst case to allow further EXAP
X.56	E and E-S (No I) Dampers located remote from the supporting construction.	Change in design of fire resisting ductwork section - damper remote from the wall	See rule	See rule	See rule	If the damper is successfully tested with an uninsulated duct and damper casing, then any suitably tested fire-resisting duct system (EN 1366-1) may be used in practice, including the damper housing if tested with a protection system.

9 Report of the extended application analysis

The Extended Application Report shall be used in conjunction with the classification document and the test report(s). The following information shall be included in the report.

a) Name of the sponsor;

b) The type of element tested specimen(s);

This shall include a general description including any trade names of all the products included.

c) Description of the change(s) to be made;

d) Summary of test report(s) and previously granted extended applications. This is a specially prepared synopsis of the relevant test evidence and not necessarily a summary as given in the report. It is acceptable to append full copies of the relevant documents. This shall incorporate a clear statement of the proposed variations considered in this document, which shall include previously requested changes;

e) Method of determination of worst case if this is relevant;

f) Expression of the relevant parameter(s) and the list of the factors considered;

g) For each factor to mention if the influence of the change to be made will lead to:

   1) favourable, with a detailed explanation in writing;

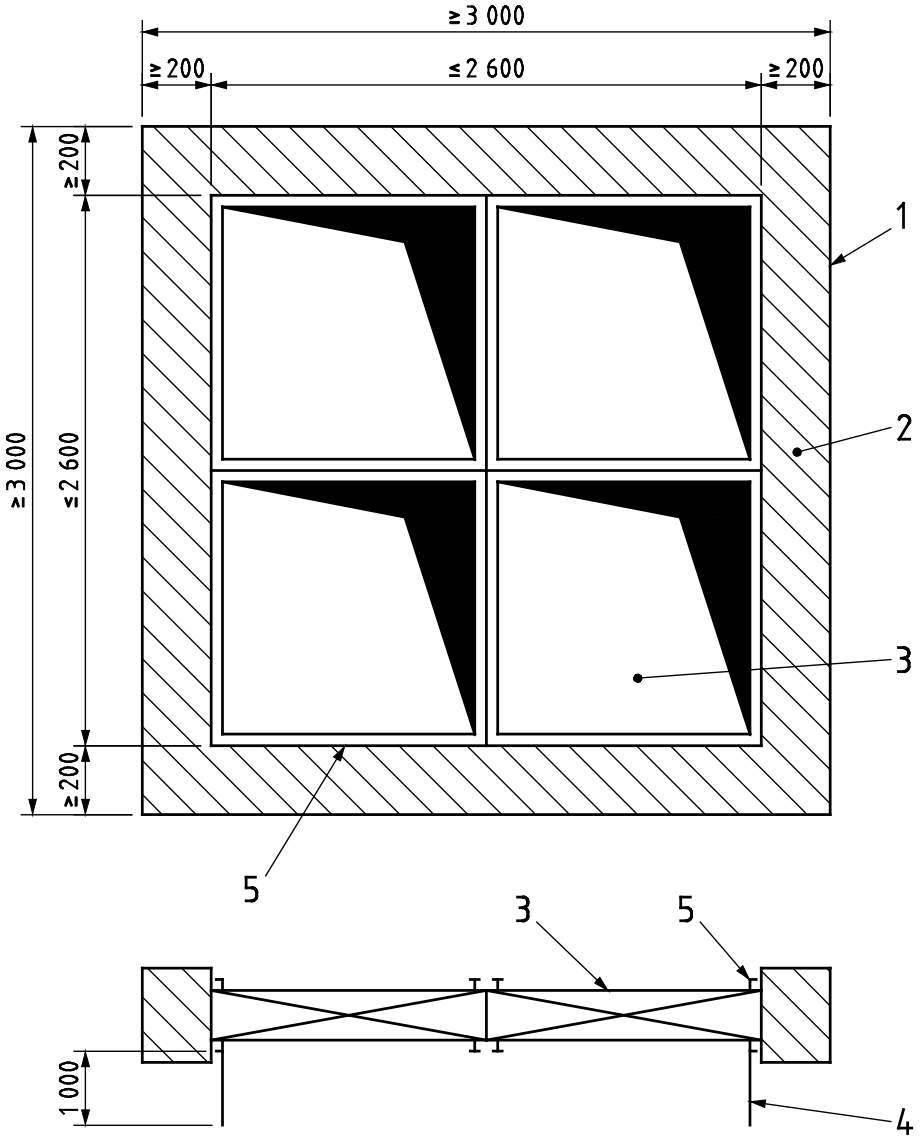
   2) unfavourable, with a detailed explanation in writing;

   3) no influence, with a detailed explanation in writing;

with regard to the appropriate criterion relating to the fire resistance of the element.

h) Conclusion; This shall state the fire resistance classification in accordance with EN 13501-3 and the new/revised field of extended application of the new design.

Dimensions in millimetres



Key

1 test frame
2 standard supporting construction
3 Individual damper unit/section
4 extended duct section – 1,2 mm galvanized mild steel
5 integrity seal

Figure 1 — Method of testing multiple assemblies

Bibliography

ISO 10294-1, *Fire resistance tests - Fire dampers for air distribution systems - Part 1: Test method*

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