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Extended application of results from fire resistance tests for service installations - Part 2:
Fire dampers

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

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

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Extended application of results from fire resistance tests for service installations - Part 2: Fire dampers

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Brandschutzklappen

This European Standard was approved by CEN on 15 August 2022.

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European foreword

This document (EN 15882-2:2022) 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of an identical text or by endorsement, at the latest by March 2023, and conflicting national standards shall be withdrawn at the latest by March 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 15882-2:2015.

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

- Clause 4 was expanded and re-titled “Test requirements for assessment of design changes and modification of the manufacturing process”. This defines options for EXAP where changes are proposed, what needs to be done pre-test, fire tests that need to be done etc. This is supported by the new rule X.65 where such changes are proposed.
- Provisions on how to handle the replacement or new actuators, operating mechanisms and fusible elements have become more detailed. Further support is also given in the rules.
- Clause 5 now details more comprehensively the selection of the worst case.
- Clause 6 now contains more details on hangers and fixing flanges and on the testing of multiple units. It also covers the use of alternative penetration seals.
- The rules are similar (some are new, some changed); the numbering changed.
- Changes were made with respect to the use of different materials (particularly stainless steels) and the positioning of flanges, brackets etc.

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

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

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

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia,

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Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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Introduction

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

Some rule references and content have changed from the previous version of this document and some conclusions to the previous version may not be acceptable in the light of this new information.

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EN 15882-2:2022 (E)**1 Scope**

This document provides guidance and rules to notified bodies (for fire dampers) allowing them to produce/validate an extended field of application report for fire dampers based on testing undertaken in accordance with EN 1366-2. This document identifies the parameters that affect the fire resistance of fire 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 document 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 document does not cover dampers used for smoke control or non-mechanical fire barriers.

It is the intention that the application of this document makes it possible to identify which specifications to test to maximize the field of application. Some information on test programmes is given for guidance purposes.

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

EN 1363-1, *Fire resistance tests - Part 1: General requirements*

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

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

EN 1366-3, *Fire resistance tests for service installations - Part 3: Penetration seals*

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*

EN 15650:2010, *Ventilation for buildings - Fire dampers*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1363-1, EN 1366-2, EN 15650 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

multiple damper assembly

assembly of several individual fire damper units arranged next to each other, or above each other, to form a larger unit

3.2

horizontal

orientation/position of the damper mounted in a horizontal plane

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

3.3

vertical

orientation/position of the damper mounted in a vertical plane

EXAMPLE 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 (as described in EN 1363-1) and for which a direct field of application has been established

4 Test requirements for assessment of design changes and modification of the manufacturing process

4.1 General

Many manufacturers will want to introduce manufacturing changes to make use of differing production techniques, whilst essentially keeping a product the same. In addition, they may wish, for example, to change actuators and activating mechanisms, sometimes across a range of product models.

The test methods described in the following subclauses shall not be used to develop the application to other supporting constructions and installation methods in those supporting constructions.

4.2 Design and manufacturing changes

4.2.1 Pre-test

Before any fire testing is undertaken the relevant cycle tests and leakage tests at ambient temperatures shall be undertaken to prove the durability of the proposed change in accordance with EN 15650.

EN 15882-2:2022 (E)**4.2.2 Fire test**

The effect of design and manufacturing changes on the declared performances of essential characteristics of the fire damper shall be proven by fire testing the fire damper in a previously tested supporting construction and using the same installation method.

The supporting construction shall be the lightest in terms of mechanical stability that the fire damper was previously tested in (e.g. dry wall versus solid masonry etc.). The fire damper shall be presented to the test from the direction of the worst result obtained in previous testing or, if this is not clear from previous test evidence, then with the actuator inside the furnace.

4.2.3 Extended field of application

Having passed the fire test in 4.2.2, the fire damper shall have the ability to be used for all other existing classifications with an equal or lower classification time for the same supporting construction using any already tested installation methods.

This is also allowed for all its other existing models with classifications with equal or lower classification times in heavier supporting constructions with their different installation methods in accordance with the existing direct field of application.

4.3 Actuators, remote triggering devices, actuating mechanisms, fusible links and sensing elements**4.3.1 Actuators****4.3.1.1 General**

If the fire damper assembly is a new design, previously untested, this section does not apply, and the fire damper shall be tested fitted with the actuator in accordance with EN 1366-2 from both sides.

If the fire damper assembly has not been previously tested from both sides using an actuator/mechanism etc, then this section does not apply until the fire damper assembly has been tested with the actuator in accordance with EN 1366-2 from both sides.

When either of the above have been successfully tested the following may be applied.

All the following shall be undertaken in the order shown.

Actuator models with different voltages (e.g. 24 V, 230 V or multi-voltage) are considered to have no influence on fire safety. Just one voltage needs to be tested. In the case of multi-voltage any voltage may be tested.

4.3.1.2 Fire damper ambient cycle test

At least one sample of the fire damper assembly with the proposed new actuator shall be subjected to an ambient cycle test.

The minimum number of cycles performed shall correspond to the expected application as shown in EN 15650.

If different motive powers are proposed, then an actuator with each motive power level shall be subjected to the cycle tests.

4.3.1.3 Confirmatory acceptance fire test

At least one sample (different to those in 4.3.1.2) of the proposed new actuator shall be subjected to a fire test in accordance with EN 1366-2 on a previously tested fire damper obtained from the fire damper manufacturer, installed in the lightest wall construction (generally lightweight metal stud partition with one board on each side as the worst case).

In cases of insulated fire dampers (with an EI classification), the actuator shall be positioned inside the furnace. With only E classification dampers, two units shall be tested; one mounted on an E classification fire damper inside the furnace and one mounted on an E classification fire damper outside the furnace. Successful completion of a fire test on E classification fire dampers will allow use on EI classification fire dampers.

To avoid confusion, even if the fire damper has the actuator mounted on the centre line, the product shall be tested from both sides in the case of E or EI classification dampers.

In each case the fire damper shall perform at least as well, with regard to its classification times, as it did in the same test previously. Tests performed on a vertically mounted fire damper will be applicable to horizontally mounted fire dampers and vice versa.

4.3.1.4 Field of application

Provided all the above are fulfilled in order, the actuator may be fitted by the fire damper manufacturer on tested families and series of fire damper. This shall apply to all tested installations and applications.

4.3.2 Actuators with an associated thermal element device that controls the action of the actuator to close the fire damper in the event of fire

4.3.2.1 General

If the fire damper assembly is a new design, not previously tested, this section does not apply, and the fire damper shall be tested fitted with the associated actuator in accordance with EN 1366-2 from both sides.

If the fire damper assembly has not been previously tested from both sides using an actuator with associated thermal element device then this section does not apply until the fire damper assembly has been tested with the associated actuator in accordance with EN 1366-2 from both sides.

When either of the above have been successfully tested, the following may be applied.

All the following shall be undertaken in the order shown.

Actuator models with different voltages (e.g. 24 V, 230 V or multi-voltage) are considered to have no influence on fire safety. Just one voltage needs to be tested. In the case of multi-voltage any voltage may be tested.

4.3.2.2 Fire damper ambient cycle test

As in 4.3.1.2.

4.3.2.3 Confirmation of the thermal element device

The thermal element device shall pass the requirements of ISO 21925-1 (previously in ISO 10294-4 as originally referenced in EN 15650).

4.3.2.4 Confirmatory acceptance fire test

As in 4.3.1.3.

If only the design of a thermal element device has been changed, conformity with 4.3.1.2 shall be fulfilled without additional fire testing.

4.3.2.5 Field of application

Provided all the above are fulfilled in order, the actuator with the thermal element device may be fitted by the fire damper manufacturer on tested families and series of fire damper. This shall apply to all tested installations and applications.

EN 15882-2:2022 (E)**4.3.3 Remote triggering device (e.g. magnet)****4.3.3.1 General**

In all cases fire dampers must have a thermal element device. This section covers any additional remote mechanical triggering device.

If the fire damper is a new product, not previously tested, this section does not apply, and the fire damper shall be tested fitted with an associated remote triggering device in accordance with EN 1366-2, from both sides.

If the fire damper has not been previously tested from both sides using an associated remote triggering device, then this section does not apply until the fire damper has been tested in accordance with EN 1366-2 from both sides.

When either of the above have been successfully tested the following may be applied.

All the following shall be undertaken in the order shown.

4.3.3.2 Fire damper ambient cycle test

At least one sample of the fire damper assembly with the proposed new remote triggering device shall be subjected to an ambient cycle test.

The minimum number of cycles performed shall correspond to the expected application as shown in EN 15650.

4.3.3.3 Confirmatory acceptance fire test

At least two samples (different from 4.3.3.2) of the fire damper with the proposed new remote triggering device shall be subjected to a fire test in accordance with EN 1366-2 on a previously tested fire damper obtained from the fire damper manufacturer in the lightest wall construction (generally lightweight metal stud partition with one board on each side as the worst case).

Two units shall be tested; one with new remote triggering device mounted inside the furnace and one with the new remote triggering device mounted outside the furnace.

To avoid confusion, even if the fire damper has the new remote triggering device mounted on the centre line, the product shall still be tested from both sides.

In each case the fire damper shall perform at least as well as it did in the same test previously. Tests performed on a vertically mounted fire damper will be applicable to horizontally mounted fire dampers and vice versa.

4.3.3.4 Field of application

Provided all the above are fulfilled in order, the new remote triggering device may be fitted by the fire damper manufacturer on tested families and series of fire damper. This shall apply to all tested installations and applications.

4.3.4 Actuating mechanism**4.3.4.1 General**

The actuating mechanism is the connection mechanism between the actuator and/or remote release mechanism and the damper blade. Modification may be made for different reasons (e.g. to simplify the construction or change mechanical advantage).

If the fire damper assembly is a new product, previously untested, this section does not apply, and the fire damper assembly shall be tested in accordance with EN 1366-2 from both sides.

If the fire damper assembly has not been previously tested from both sides, then this section does not apply until the fire damper assembly has been tested in accordance with EN 1366-2 from both sides.

When either of the above have been successfully tested the following may be applied.

All the following shall be undertaken in the order shown.

4.3.4.2 Fire damper ambient cycle test

At least one sample of the fire damper assembly with the proposed new actuating mechanism shall be subjected to an ambient cycle test in each orientation proposed (e.g. horizontal and/or vertical).

The minimum number of cycles performed shall correspond to the expected application as shown in EN 15650.

The mechanical advantage shall not be reduced.

If the previous actuating mechanism to be replaced does not have this data available for comparison then the previous actuating mechanism shall be tested in this way at the same time as the proposed new actuating mechanism to maintain consistency of testing.

4.3.4.3 Confirmatory acceptance fire test

At least two samples (different to those used 4.3.4.2 above) of the fire damper with the proposed new actuating mechanism shall be subjected to a fire test in accordance with EN 1366-2, on a previously tested fire damper in the lightest wall construction (generally lightweight metal stud partition with one board on each side).

The actuator shall be mounted such that if the fastenings or pins preventing rotation fail, the weight of the damper shall act to try and open the blades by putting an opening moment on the drive spindle to the actuating mechanism.

Two units shall be tested, one with the actuating mechanism mounted inside the furnace and one with the actuating mechanism mounted outside the furnace.

To avoid confusion, if the fire damper has the actuating mechanism mounted on the centre line, the product shall still be tested from both sides.

In each case the fire damper shall perform at least as well as it did in the same test previously. Tests performed on a vertically mounted fire damper will be applicable to horizontally mounted fire dampers and vice versa.

4.3.4.4 Field of application

Provided all the above are fulfilled in order, the actuating mechanism may be fitted to any smaller fire damper of the same type/family with the same or lower nominal declared torque on all the manufacturers tested families and series of fire damper. This shall apply to all tested installations and applications.

4.3.5 Fusible links and elements (not associated with the actuator supplier)

4.3.5.1 General

If the fire damper assembly is a new product, previously untested, this section does not apply, and the fire damper assembly shall be tested in accordance with EN 1366-2 from both sides.

If the fire damper assembly has not been previously tested from both sides, then this section does not apply until the fire damper assembly has been tested with the associated fusible link and element in accordance with EN 1366-2 from both sides.

When either of the above have been successfully tested, the following may be applied.