



SLOVENSKI STANDARD

oSIST prEN 15882-2:2021

01-maj-2021

Razširjena uporaba rezultatov preskusov požarne odpornosti servisnih inštalacij - 2. del: Požarne lopute

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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Ta slovenski standard je istoveten z: prEN 15882-2

ICS:

13.220.50	Požarna odpornost gradbenih materialov in elementov	Fire-resistance of building materials and elements
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en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 15882-2

March 2021

ICS 13.220.99

Will supersede EN 15882-2:2015

English Version

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

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

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 127.

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

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European foreword

This document (prEN 15882-2:2021) has been prepared by Technical Committee CEN/TC 127 “Fire safety in buildings”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

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 mandate given to CEN by the European Commission and the European Free Trade Association.

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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.

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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. This document 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 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.

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

EN 1366-1:2014+A1:2020, *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*

EN 15650, *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 <http://www.electropedia.org/>

— ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

multiple assembly

multiple damper assembly

assembly of individual damper units to form larger units

prEN 15882-2:2021 (E)**3.2****horizontal**

orientation/position of the damper mounted horizontally

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

3.3**vertical**

orientation/position of the damper mounted vertically

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 and for which a direct field of application has been established

4 Test requirements for assessment of design changes**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 to change actuators and activating mechanisms, sometimes across a range of products.

Such a test shall not be used to develop the application to other supporting constructions and installation methods in those supporting constructions.

4.2 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.

4.2.2 Fire test

Manufacturing changes shall be proven by fire testing the fire damper in previously tested supporting construction and using the same installation method. The supporting construction shall be the lightest 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

The fire damper shall have the ability to be used for all other existing classifications for the same supporting construction using different installation methods and also all for all its existing classifications in heavier supporting constructions with their different installation methods.

4.3 Actuators, remote triggering devices, actuating mechanisms, fusible links and sensing elements

4.3.1 Actuators

4.3.1.1 General

This only applies to new ranges of actuator provided by the same actuator manufacturer.

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

If the fire damper has not been previously tested from both sides using an actuator, then this section does not apply until the fire damper has been tested with the actuator associated 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.

4.3.1.2 Actuator ambient cycle test under load

At least one sample of the proposed new actuator shall be subjected to an ambient cycle test under load in both directions of rotation by the actuator manufacturer. The actuator will not be connected to a fire damper for this test. The load applied shall be at least the nominal declared load in accordance with the actuator specification and shall be set by the actuator manufacturer. The minimum number of cycles performed shall correspond to the expected application. This shall be 10 200 for general purpose fire damper actuators and 20 000 for modulating fire dampers. If different motive powers are proposed, then an actuator with each motive power level shall be subjected to the cycle tests.

The ambient spring return running time shall be the same or shorter than the actuator being replaced.

The ambient spring return torque shall be the same or greater than the actuator being replaced.

The ambient angle of rotation shall be the same as the actuator being replaced.

The calorific value of any combustible material in the actuator construction shall be the same or less than the actuator being replaced.

If the actuator range (from the same manufacturer) of the actuator being replaced does not have this data available for comparison it shall be tested in this way at the same time as the proposed new actuator.

4.3.1.3 Actuator fire test

At least one sample (different from that in 4.3.1.2) of the proposed new actuator shall be subjected to a fire test under load by the actuator manufacturer. The load to be used shall be set by the actuator manufacturer and shall be at least the nominal declared load corresponding to 4.3.1.2.

The actuator shall perform 50 cycles at ambient prior to the fire test under nominal declared load specified by actuators manufacturer.

The actuator shall be mounted on the inside of the furnace with the loading arranged on the outside of the furnace.

The actuator shall be subjected to a fire test following the general fire test parameters of EN 1366-2.

The actuator shall be powered to the ON (open) position before the test is started and released to the OFF (closed) position by removing the supply power when furnace reaches 50°C. The actuator shall reach the OFF (closed) position in less than two minutes.

The actuator shall maintain its position for the same time or longer than the actuator being replaced.

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If the actuator range (from the same manufacturer) of the actuator being replaced does not have this data available for comparison it shall be tested in this way at the same time as the proposed new actuator.

4.3.1.4 Confirmatory acceptance fire test

At least one sample (different to those in 4.3.1.2 and 4.3.1.3) 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 any 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.

4.3.1.5 Field of application

Provided all the above are satisfactorily fulfilled in order, the actuator may be supplied to and fitted by any fire damper manufacturer who has previously fitted a similar actuator from the same actuator 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**

This only applies to new ranges of actuator provided by the same actuator manufacturer

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 the associated actuator in accordance with EN 1366-2 from both sides.

If the fire damper 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 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.

4.3.2.2 Actuator ambient cycle test under load

As in 4.3.1.2.

4.3.2.3 Actuator fire test

As in 4.3.1.2.

4.3.2.4 Confirmation of the thermal element device

The thermal element device shall satisfactorily pass the requirements of ISO 21925-1 (previously in ISO 10294-4).

4.3.2.5 Confirmatory acceptance fire test

As in 4.3.1.3.

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

4.3.2.6 Field of application

Provided all the above are satisfactorily fulfilled in order, the actuator with the thermal element device may be supplied to and fitted by any fire damper manufacturer who has previously fitted a similar actuator with a thermal element device from the same actuator manufacturer on tested families and series of fire damper. This shall apply to all tested installations and applications.

4.3.3 Remote triggering device (e.g. magnet)

4.3.3.1 General

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 Damper ambient cycle test

At least one sample of the fire damper with the proposed new remote triggering device shall be subjected to an ambient cycle test under load. The cycles performed shall be at minimum corresponding to the expected application. The minimum number of cycles performed shall correspond to the expected application: This shall be at least 300 cycles (10 200 or 20 000 may be selected). If different motive powers are proposed, then a remote triggering mechanism with each motive power level shall be subjected to the cycle tests.

4.3.3.3 Confirmatory acceptance fire test

At least two samples (different from 4.3.1.2) of 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 any fire damper manufacturer in the lightest wall construction (generally lightweight metal stud partition with one board on each side / 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 satisfactorily fulfilled in order, the new remote triggering device may be supplied to and fitted by any fire damper manufacturer who has previously fitted a similar remote

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

If the fire damper has not been previously tested from both sides, 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.

4.3.4.2 Damper ambient cycle test

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

The minimum number of cycles performed shall correspond to the expected application. This shall be 300 for remote release only, 10 200 for general purpose fire damper actuators and 20 000 for modulating fire dampers.

The mechanical advantage shall not be reduced.

If the previous actuating mechanism to be replaced does not have this data available for comparison it shall be tested in this way at the same time as the proposed new actuator.

4.3.4.3 Confirmatory acceptance fire test

At least two samples (different to those used 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 satisfactorily fulfilled in order, the actuating mechanism may be fitted to any smaller fire damper 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.

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

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

If the fire damper has not been previously tested from both sides, then this section does not apply until the fire damper 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.

All the following shall be undertaken in the order shown.

4.3.4.6 Damper ambient cycle test

At least one sample of the fire damper with the proposed new fusible link or sensing element shall be subject to an ambient cycle test. The cycles performed shall correspond to the expected application at a minimum.

The test method shall follow the cycling tests for the expected application, as shown in EN 15650.

4.3.4.7 Confirmation of the thermal element device

The thermal element device shall satisfactorily pass the requirements of ISO 21925-1 (previously in ISO 10294-4).

4.3.4.8 Confirmatory acceptance fire test

At least two samples (different from those in 4.3.1.2 and 4.3.1.3) of the fire damper with the proposed new fusible link or sensing element 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 as the worst case).

Two units shall be tested, one with the fusible link or sensing element mounted inside the furnace and one with the fusible link or sensing element mounted outside the furnace.

To avoid confusion, even if the fire damper has the fusible link or sensing element 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.

4.3.4.9 Field of application

Provided all the above are satisfactorily fulfilled in order, the fusible link or sensing element may be supplied to and fitted by any fire damper manufacturer who has previously fitted a similar fusible link or sensing element, from the same fusible link or sensing element manufacturer, on tested families and series of fire damper. This shall apply to all tested installations and applications.