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Fire safety assessment no.
BB-TUM-001-2018_R1
for
the maintenance requirements of the
GeBa fire damper WFK

Customer: Bartholomäus GmbH
Bachstraße 10
D-89607 Emerkingen

Mandate by: Mr. Gert Bartholomäus
Mandate from: 08.01.2018

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Content of the fire safety assessment:

Fire safety assessment of MBO §3, maintenance of buildings relating to fire dampers of type WFK of the company Bartholomäus GmbH in Emerkingen, Germany.

This fire safety assessment cannot be used as Building Inspectorate Suitability Certification.

Page count the of fire safety assessment: 24 pages.

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1 Circumstances and purpose of the fire safety assessment

1.1 Circumstances

The client is inter alia manufacturer of shut-off devices in ventilation systems to prevent the transmission of fire and smoke (fire dampers). The fire dampers marketed must comply with the harmonized European product standard hEN 15650 (4). This means that according to hEN 15650 (2) the fire damper must be proofed. This primarily includes the fire test of the models in walls and ceilings. In doing so, proof must be provided that on the side facing away from the fire the defined limit values are observed for the permissible temperature increases (maximum value and mean value) at predetermined positions as well as the limit value of the leakage of the shut-off device. This is to be understood as meaning the flap closing the cross section, at a pressure difference of at least 300 Pa. In case of fire, the triggering element must be triggered within two minutes after the start of the fire and the shut-off device must permanently close the air-conducting cross-section. The energy required to close the shut-off device is provided by a preloaded spring or by a motor or pneumatic drive, depending on the requirements of normal operation.

In the first case, a spring is pre-tensioned, which ensures the open position in the event of a fire over the entire service life by means of a triggering element to be activated via the air temperature. This drive and release mechanism is designed for single use. The trigger mechanism releases the drive mechanism when the nominal triggering temperature, typically 72 °C, is reached.

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This means that the drive mechanisms must function flawlessly even after years of use in case of fire. That this requirement must be met is shown in §3 of the Model Building Code (MBO) (1). This states, „Facilities are and are to be maintained so that public safety and order, especially life, health and the natural foundations of life, are not endangered“.

The requirement of the MBO is a general requirement and does not further refer to rules describing the required maintenance measures. It is certain, that the functional safety in the application is the responsibility of the plant operator.

The manufacturer's responsibility for functional safety lies in the fact that he describes measures for his fire damper which allow the user of the fire damper, i. e. the system operator, to fulfill the requirement of §3 of the MBO.

A general note on the basics of maintenance is provided by DIN 34051: June 2003 (2). The key messages of the standard refer to mechanical systems, where the use-oriented use of the „wear stock after production“ decreases with the useful life after a characteristic of the product time-dependent function to the wear limit (see Figure 1). If the wear limit is reached, the necessary measures for the repair of the product are to be carried out, which ideally lead back to the original wear stock.

The manufacturer or the person placing the fire damper on the market must provide the user with information on installation and maintenance in accordance with section 8 et seq. of hEN 15650: 2010 (4). The installation details are relevant for the installer of the ventilation system. The relevant section of hEN 15650: 2010 (4) is contained in Appendix 8.1 of this document.

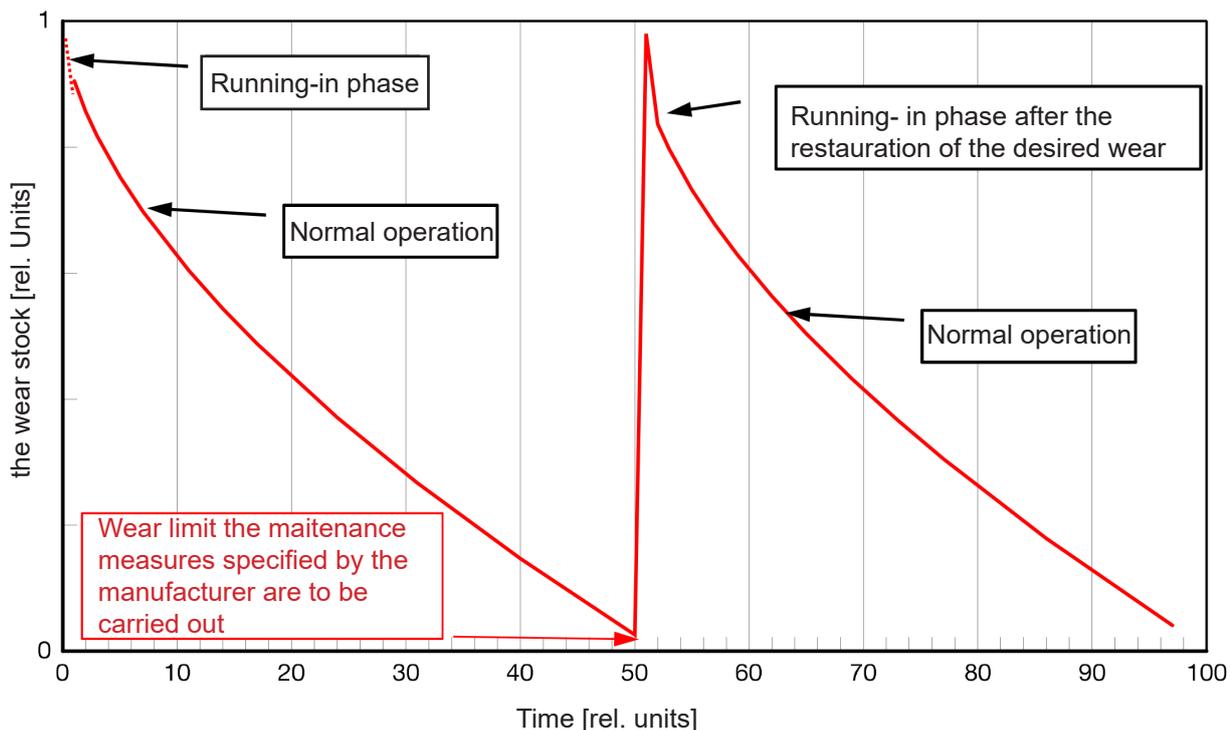


Figure 1: Example of the course of the decrease of the wear stock during the use according to the appropriate use.

Hausladen and Berghofer provide an overview of the different regulations for the maintenance of ventilation systems in the brochure “Conceptual Fire Protection“ (17).

1.2 Purpose of the fire safety assessment

The client commissioned the research laboratory for housing services of the Technical University of Munich to check and evaluate the installation and operating instructions for the fire dampers of the WFK type, to what extent the requirements of the regulations are fulfilled and the described measures for maintenance and servicing fulfill the requirement of §3 of the MBO.

2 Used documents and information

- (1) Model building regulations (Musterbauordnung MBO) – version of November 2002, as last amended by the conference of ministers of construction dated 13.05.2016;
- (2) DIN 31051:2003-06; basics of maintenance;
- (3) DIN EN 13306:2001; terms of maintenance, trilingual version;
- (4) DIN EN 15650: 2010-09; ventilation of buildings – fire dampers;
- (5) List of the harmonized standards; version: 15.12.2017; http://eur-lex.europa.eu/legal-content/DE/TEXT/?uri=uriserv:OJ.C_.2017.435.01.0152.01.DEU&toc=OJ:C:2017:435:TOC
- (6) DIN EN 1363-1:1999-10 Fire Resistance Test, Part 1: General Requirements, version of October 2012;
- (7) DIN EN 1366-2:1999-10: Fire Resistance Test for installations, Part 2: Fire dampers;
- (8) EN 13501-3:2005, Classification of construction products and types for their fire behavior, Part 3: Classification with the results of the fire resistance tests on building services components: Fire-resistant cables and fire dampers;
- (9) DIN EN 1751:2014-06, Ventilation for buildings – devices of the air distribution system – aerodynamic testing of throttles and shut-off elements;
- (10) ISO 10294-4:2001-04, Fire Resistance Tests – fire dampers in ventilation ducts - Part 4: testing the temperature-triggering closing device;
- (11) Declaration of Performance DoP/WFK/DE/2017/001 for shut-off elements against fire transmissio in ventilation ducts, fire dampers of type WFK; manufacturer Bartholomäus GmbH, Bachstraße 10 in D - 89607 Emerkingen; version: 14.11.2017;
- (12) Installation and operating instructions for the geba fire damper of type WFK according to EN 15650 with free cross section for use in ventilation and air conditioning systems of buildings; Publisher: Bartholomäus GmbH, Bachstraße 10 in D - 89607 Emerkingen; version: 12/201;
- (13) Model directive on fire protection requirements for ventilation systems (model ventilation system guideline – M-LüAR); status: 29.09.2005, last amended by the decision of the commission for construction supervision dated 11.12.2015;
- (14) Communication from the Commission in the framework of the implementation of Regulation (EU) No 305/2011 of the European Parliament and of the Council laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106 / EEC (Publication of Title and reference numbers of the harmonized standards within the meaning of the EU harmonization legislation) (Text with EEA relevance) (2017 / C 435/03); the provisions of Regulation (EU) No 305/2011 take precedence over other provisions in the harmonized standards.

- (15) Quote from (14):
Reference number and title of standard (and reference): EN 15650: 2010 Ventilation for buildings - Fire dampers
Reference of the superseded standard: -
Start of the application of the standard as harmonized standard. 1.9.2011
End of the co-existence period: 1.9.2012
- (16) Model Administrative Provisions Technical Building Regulations (M-VV-TB), August 2017 edition; Official announcements 31.08.2017; Publisher: Deutsches Institut für Bautechnik, represented by the President Gerhard Breitschaft, Kolonnenstr. 30 B in 10829 Berlin;
- (17) G. Hausladen and E. Berghofer; CONCEPTUAL FIRE PROTECTION; Strategies for holistic building design; Issue 6/2004 Maintenance of Ventilation Systems: Authors: Prof. Dr.-Ing. Gerhard Hausladen, Dipl.-Ing. Arch. Ernest Berghofer; Ed .: Prof. Dr.-Ing. Gerhard Hausladen and Dr. Zuzana Giertlova, Chair of Building Climatology and Building Technology Faculty of Architecture, Technical University Munich, Arcisstr. 21 in 80333 Munich, ISSN 1613-7841
- (18) Development of a sustainable home ventilation system with regard to fire protection as a „system“; Ernest Berghofer, Dissertation to obtain the academic degree of a Doctor-Engineer; Technical University of Munich, Faculty of Architecture; 09.10.2015

3 Construction and operating principles of fire dampers in normal cases and fire

The EN 15650: 2010-09 (4) describes in section 4 the requirements for fire dampers. Section 4.1.1 describes the requirements for the demonstration of fire resistance (see Appendix 8.3 and 8.2 in this document).

3.1 Fire dampers with damper blade directly in the air flow

In general, the fire dampers consist of a housing, one or more damper blades as a closure element of the air-conducting cross section, an energy store, a thermal release element and sealing means.

Table 1: Components of fire dampers

| Components | Versions |
|-----------------------------|---|
| Housing | <ul style="list-style-type: none"> • Sheet steel, galvanized or stainless steel • Fire-prevention panels |
| Damper blade/ damper blades | <ul style="list-style-type: none"> • Of fire-prevention panels • Of steel sheet |
| Energy store | <ul style="list-style-type: none"> • Preloaded torsion spring • Preloaded gas spring • Electric drive <ul style="list-style-type: none"> o Electrically opening, spring drive closing o Electrically opening, electrically closing • Pneumatic drive, opening and closing |
| Thermal release | <ul style="list-style-type: none"> • Lock for the open position <ul style="list-style-type: none"> o Fusible link as a thermally active element o Plastic element as a thermally active element • The motor-driven BSK mostly uses systems with a self-locking gear, and the closing process is usually activated by electrothermal tripping elements. |
| Sealant | <ul style="list-style-type: none"> • Thermal frother for sealing in case of fire • Elastomer seal for ventilation operation |

The constructions of fire dampers on the market are based, with a few exceptions, on the design principle that the damper blade and the thermal triggering device are located in the airflow. Depending on the design, the power transmission (lever mechanism) is also located in the airflow. They thus have a direct influence on the aerodynamics of the ventilation system during normal operation.

As a result, there is the risk that the air that is passed through carries particles due to the plant, which may accumulate on the components during the service life. There is therefore the possibility that the deposits may cause a malfunction in the event of a fire.

Figure 2 shows a typical representative of fire dampers with damper blade and mechanics in the air flow. The picture shows a small inspection cap, which is fastened with self-tapping screws. This opening is used to inspect and maintain the fire damper as specified by the manufacturer.

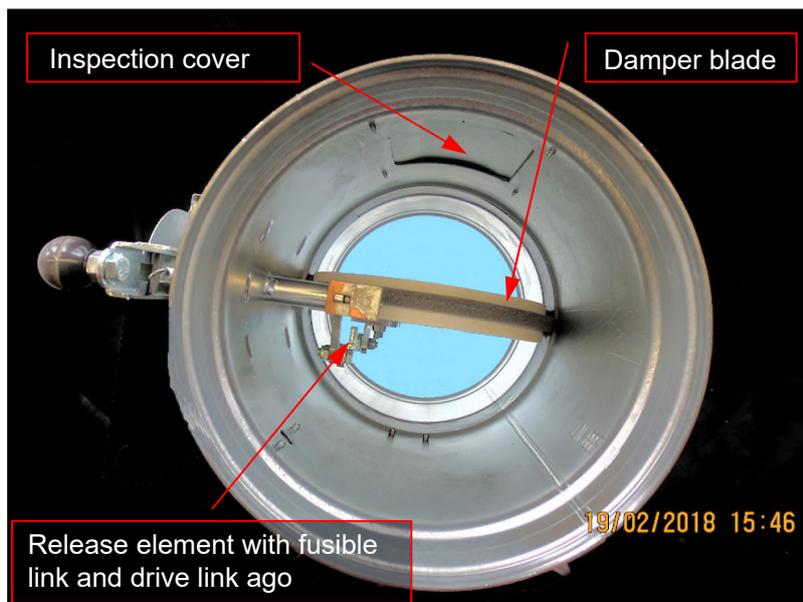


Figure 2: Typical composition of a fire damper of construction size

The soils listed in Table 2 below can be the cause of a malfunction in case of fire. Corrosion-related malfunctions are not taken into account as these are to be excluded within the scope of the verification procedure according to hEN 15650: 2010 (4).

Table 2: Possible malfunction due to contamination of fire dampers and their avoidance during maintenance

| Component | Contamination | Malfunction | Solution | |
|---|---|---|----------|-------------------------------|
| | | | Cleaning | Replacement ¹ |
| Damper blade made of mineral building material (fire prevention panels) | Deposit by greasy air from apartment kitchens | Ignition on the side facing away from the fire | No | no |
| Triggering element | Fatty deposit; adherence of dust particles and lint | Delayed response of the fusible link | yes | Depending on the construction |
| Drive elements inside the fire damper | Penetration of particles into the bearings, hardening of the deposit. | Closing process is delayed or prevented; BSK does not close | yes | Depending on the conctriction |

The replacement of the damper blade is basically impossible with these fire dampers in the installed state, since the storage is located within the housing and this area is located during regular installation in walls and ceilings in the circumferential annular gap of the support structure. The annular gap is often closed with mortar. If installed in soft bulkheads, the extraction would be possible by removing the fire damper, but this would mean that the soft bulkhead would be destroyed and therefore had to be renewed.

¹ In the case of an exchange, it is assumed that this only takes place via the revision opening. It is also possible to disassemble the connected ventilation duct and thus provide access via the air-conducting cross section. This leads to a considerable effort.

3.2 Fire damper type WFK

The fire damper TYPE WFK is based on the principle of a free air-conducting cross-section. Here, the damper blade, a two-piece flap, including the drive mechanism (stainless steel double torsion spring) and the trigger element is positioned on the circumference of the housing. In this arrangement, the air flows essentially on one side over the components. The triggering unit with the triggering element made of plastic lies in each case in the edge region of the flow and is directly flowed around by its positioning.

Figure 3 shows the open fire damper type WFK. The two-part damper blade can be seen. Each half of the cross-section closing damper blade consists of three segments which are hinged together via a spring plate. This allows the damper blade in the open state almost to circularly nestle against the housing.

Flow tests with flue gas with a WFK with one-sided duct connection have shown that the inner internals produce hardly visible visually noticeable turbulences with free outflow. In this construction one can assume an undisturbed free cross-section

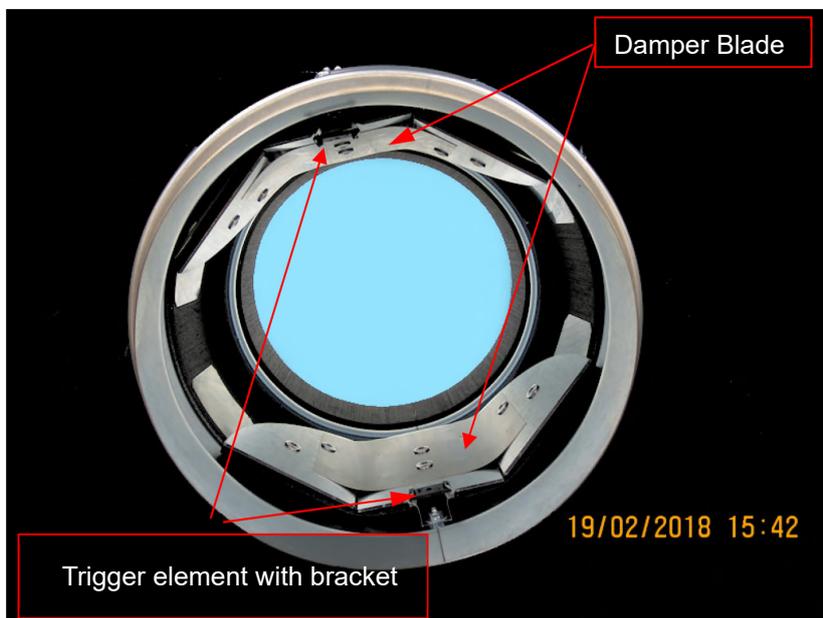


Figure 3: Open fire damper type WFK

Figure 5 shows the side view of the WFK. Here it can be seen that the housing for receiving the damper blades in diameter is larger than the nominal diameter of the connectable ventilation duct. This explains the almost undisturbed flow of the flue gas. The distances between the housing and the damper blades are so small that a flow through this area almost does not take place. This is also evident in the flow tests.

The flow tests have also shown that the trigger element is completely flowed around due to its positioning and is thus exposed directly to the temperature in case of fire.

Figure 4 shows a damper blade and the release element with bracket after disassembly. When installed, the bracket (spring steel sheet) of the trigger element is located in the claw and holds the damper blade in the „open“ position. When the temperature reaches the softening point of the trigger element, this is deformed by the longitudinal force and releases the holder in the claw. The torque of the double torsion spring causes the closing of the damper blade. Both damper blades seal the cross section permanently. The still acting torque on the damper blades is sufficient to leave the WFK at a pressure difference of 300 Pa in the closed position. Therefore, a locking of the position is not required.

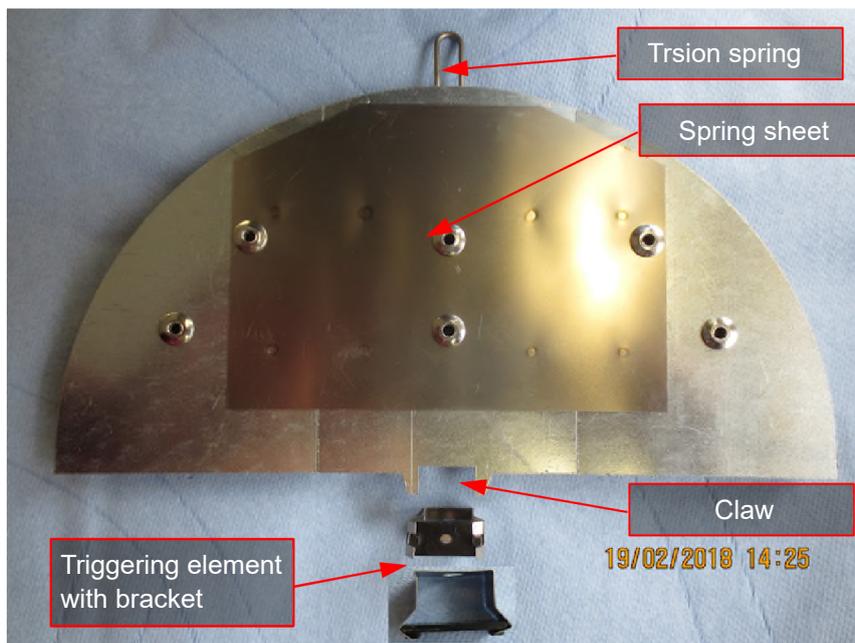


Figure 4: Damper blade and release element after disassembly

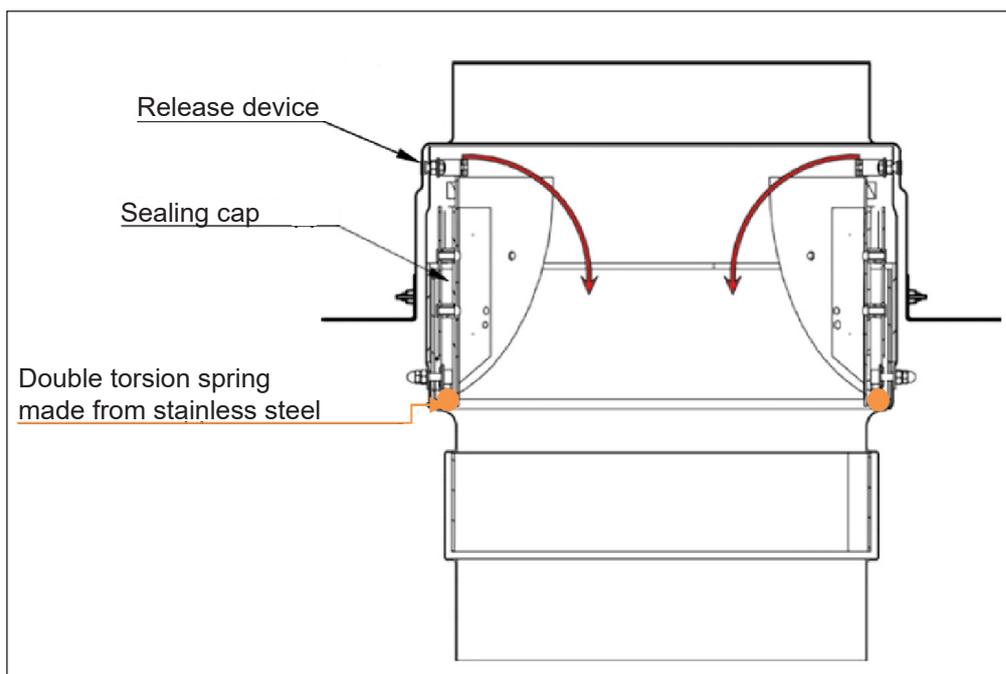


Figure 5: Sectional view of the damper WFK

The WFK is a fire damper, which is normally always in the „up“ position. In case of fire, it must close according to the rules. It meets the requirements for tightness according to hEN 15650: 2010 (4) or DIN EN 13501-3: 2005 (8). With its performance data, WFK meets the requirements for a construction product for ventilation ducts, which effectively prevents the transmission of fire and smoke. Due to their construction, the individual components are not subject to any mechanical wear.

3.2.1 Holding force for the release element of the WFK

With the experimental set-up shown in Figure 6, the holding force for the tripping element was measured in the X and Z directions. Thus, it should be determined to what extent there is a risk of tearing the trigger element out of its holder in the brush suction method applicable for cleaning according to (12).

For this purpose, here the width of the claw on the damper blade was simulated with the jaws. With the pull rod, the entire release device was drawn into the clamping jaws as far as is typical in the WFK. With a force measuring device in the X-axis and in the Z-axis, the tensile force was increased until the trigger element was pulled out of the retaining spring. The following values were determined:

Table 3: Holding force of the triggering element

| Direction of the holding force | |
|--------------------------------|-----------|
| X = radial | Z = axial |
| 30-40 N | 100-120N |

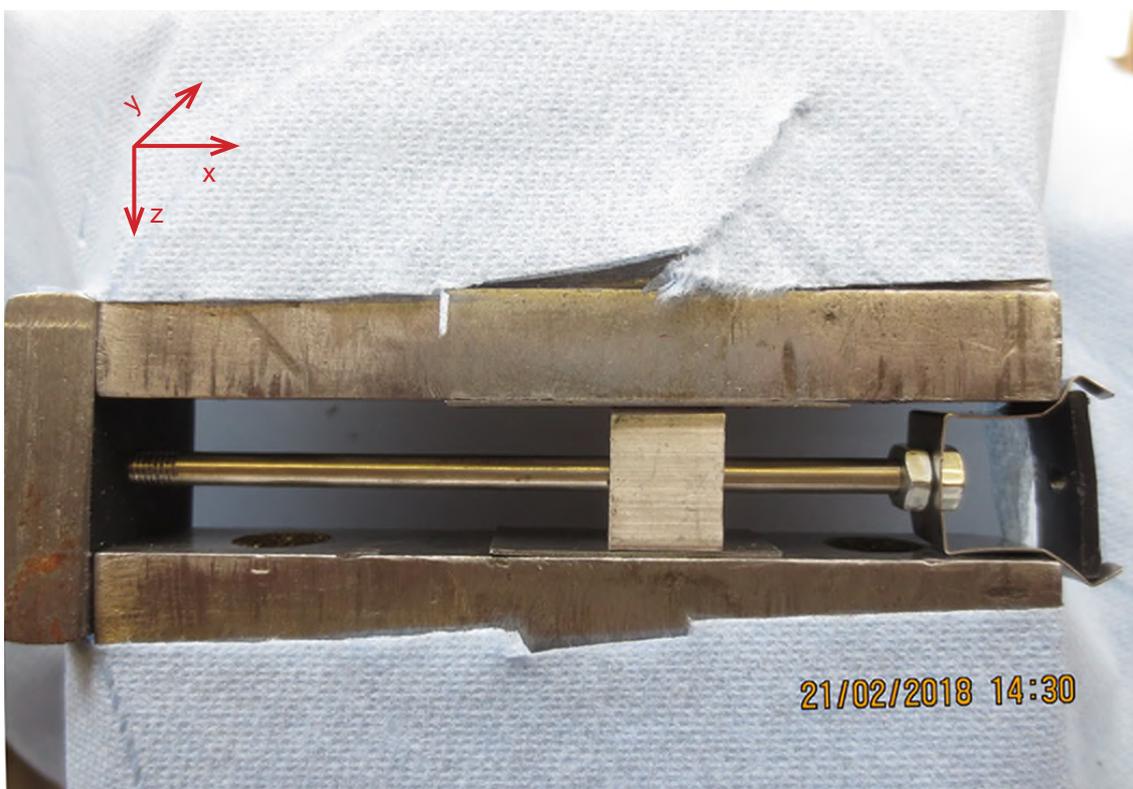


Figure 6: Experimental setup for measuring the holding force X- and Z-direction

The holding forces measured in Table 3 can be used for cleaning with the above mentioned brush suction method only by using the bristles. Prerequisite for this would be a looping of the triggering element through the bristles, which then exceed the holding force during rotation and the translation of the brushes.

According to the applicant, the bristles consist of soft fiber with a diameter of less than 0.5 mm. The length of the bristles is about 10mm.

One always takes soft brushes that are 10mm larger than the pipe diameter. In connection with the high rotational movement and the bristle length no wraps of the bristle with protruding parts will occur with the specialist company that uses such cleaning systems.

4 Inspection and maintenance of the WFK

4.1 Inspection requirements of WFK

The responsibility for the inspection of ventilation systems is according to § 3 of the Model Building Regulations with the operator of the system, so that the protection goal is achieved. In order to comply, the equipment must be checked. Since ventilation systems are safety-related systems, the initial test and the periodic test in accordance with the Safety Testing Ordinance (SPrüfV) must be carried out here.

The manufacturer of fire dampers must provide the user with an inspection and maintenance manual in accordance with hEN 15650: 2010 (4).

When used as intended, the WFK is not subject to any mechanical stress which causes a decrease in the wear stock, cf. Figure 1. There is no direct inspection required.

However, as the ventilation system is subject to a periodic inspection requirement, the condition of the WFK in relation to pollution can be inspected during this test.

If contamination of the ventilation system and the WFK is detected, the operator must arrange for cleaning of the ventilation system. In the installation and operating instructions for the WFK, it is proposed to check the degree of soiling of the WFK by means of camera inspection.

4.2 Maintenance requirements of WFK

The construction of the fire damper type WFK is not subject to mechanical wear under normal conditions of use and thus the initial wear stock remains. Therefore, maintenance of the WFK is not required.

If polluted, the WFK can be cleaned with rotating brushes. The experiments of the company Bartholomäus showed that no damage occurred at the WFK.

The WFK is offered with a nominal diameter of 100 mm to 250 mm. With these small cross-sections, manual cleaning via inspection openings is very difficult to impossible. This is also due to the very high installation density of building services.

The examination carried out by the client for cleaning with the bristle suction method showed that only minor work on the ventilation system is required. If there are deposits, they are removed and sucked off by means of the rotating or oscillating soft brush.

The triggering device of the BSK was not damaged by the cleaning. The trigger element remained in the specified position in the bracket (see Figure 4).

4.3 Use of table D1 in relation to WFK

Section 8.2 contains table D1 from hEN 15650: 2010 with proposals for the inspection of fire dampers.

The exemplary application of table D.1. for WFK shows that hEN 15650: 2010 (4) essentially refers to fire dampers with a motor or pneumatic drive.

This does not take account of structures such as those of the WFK, which represents a solution that meets the requirements for the protection goal, the transmission of fire and smoke through fire tests in accordance with DIN EN 1363-1: 1999 (6) in conjunction with DIN EN 1366-2: 1999 (7).

Table 4: Use of table D.1. on WFK

| Pos | Activity/Task | Result |
|-----|--|--|
| 1 | Specification of the damper | BSK no. |
| 2 | Date of inspection | dd.mm.jj |
| 3 | Check the wiring of the actuator for damage (if applicable) | Not applicable |
| 4 | Check wiring of limit switch for damage (if applicable) | Not applicable |
| 5 | Check the damper for cleanliness and clean if necessary | Interval of 5 years |
| 6 | Check the condition of the fins and seals, correct if necessary and log | Not applicable |
| 7 | Check the safety closing operation of the fire damper according to the manufacturer's instructions | Not applicable |
| 8 | Check that the damper moves to the OPEN and CLOSED positions using the control system and observe the damper; correct and log if necessary | Not applicable, as a one-sided installation of a new triggering element via a revision opening is not possible after release |
| 9 | Check the operation of the limit switches for OPEN and CLOSED, correct and log (if necessary) | Not applicable |
| 10 | Check if the valve performs its function as part of the control system (if necessary) | Not applicable |
| 11 | Check if the damper is in its normal working position | Unclear which requirement should be met here. |

5 Use of the fire dampers during normal operation

5.1 Non-corrosive exhaust air

Normally, it is assumed that the air pollution is so low that it does not have any negative consequences for the functional reliability of the ventilation system and thus of the WFK. This is also evident from the opinion of the building inspectorate in the discussion on the use of fire dampers in exhaust ducts of fume cupboards in chemical laboratories. As a solution to the problem of preventing a negative impact on the fire dampers by the volatilized chemical substances of any kind, it was determined that only „breathable“ air is discharged through the ventilation system and a fire damper according to hEN 15650: 2010 (4) has sufficient security and in case of fire consists.

From this it can be deduced that the fire dampers for non-corrosive substances whose concentration is below the occupational exposure limits remain functional.

5.2 Corrosive exhaust air

If there is a corrosive load through the exhaust air, the manufacturer must prove in the course of the tests that even with this load the functional safety in case of fire is given. As the quote from (4) shows, the requirement is clear. Just as clear is the installation and maintenance manual of the WFK, namely that it may not be used in certain installations.

4.2.2 Protection against corrosion

If a manufacturer wishes to prove that a fire damper has improved corrosion resistance, the test described in Annex B shall be carried out in salt spray and the results of these tests shall be indicated (i.e. pass / fail). Alternatively, this feature may be demonstrated by using and indicating products, components and treatments with known corrosion resistance.

NOTE: Except for products used in a corrosive / contaminated environment, there are no corrosion resistance requirements for products for other applications.

5.3 Improper use of the WFK

Bartholomäus GmbH has excluded the following use of WFK in the installation and operating instructions (12). In this way they describe the cases that constitute an improper use of the WFK.

- Use as smoke control damper
- Use in ex-areas
- Outdoor use without adequate protection against weather conditions
- Use in extract ventilation systems of commercial kitchens
- Use in ventilation systems where the function is hindered by heavy soiling, extreme humidity or chemical contamination.
- Use in installation situations where an internal survey, e.g. by camera inspection, and cleaning the fire damper in the installed state is not possible.

6 Summary

For this fire protection assessment, the building regulations were examined, whereby the general requirement of § 3 of the Model Building Regulations (1) was used as a starting point. According to this, the protection objective „that public safety and order, in particular life, health and the natural foundations of life, are not endangered“ is met when the facilities are maintained.

When working on the subject, there was a multiple connection between the different regulations and the term maintenance and servicing. The use of construction products is legally binding by the requirements of the MBO (1) and its implementation in the state building regulations of the federal states (LBOs). In order to fulfill the public-law requirement „Maintenance of Structural Installations“ in accordance with § 3 General Requirements of the MBO (1), additional building authority regulations must be taken into account.

First, the responsibility for the maintenance was to be presented.

While the responsibility for maintenance according to § 3 is clearly the obligation of the operator, the responsibility for clarifying the maintenance measures for a fire damper lies with the holder² of the CE certificate according to Annex ZA of hEN 15650: 2010 (4). The holder of the CE certificate must supply the fire damper with installation and maintenance instructions when placing it on the market in accordance with hEN 15650: 2010-09 (4).

The model administrative regulation of the Technical Building Regulations (M-VV-TB) (16) refers in section 7.5 to the basic standards for maintenance DIN 31051: 1985-01: June 2003 (2) and DIN EN 13306: 2001 (3) for fire dampers according to DIN EN 15650: 2010-09 (4).

The product standard hEN 15650: 2010 (4) in Section 8 does not refer to the mentioned standards, but does contain the information on maintenance given in Section 8.1.

If all applicable regulations are applied to the type WFK fire damper, then there are no requirements regarding the maintenance of the damper for the restoration of the wear stock according to DIN 31051: 2003-06 (2). All mechanical components for closing the air-conducting cross-section have been in a fixed position since the installation of the BSK. The design does not give rise to any concerns about changes that lead to malfunction in case of fire.

All relevant components for closing the free cross-section in case of fire with sufficient operational safety are not directly in the air flow in normal operation. Deposits by particles or sedimentable suspended solids can be excluded.

Due to the regulations, there is a recurring inspection obligation for ventilation systems in operation. In this context, of course, the contamination of the fire damper is checked.

The manufacturer makes appropriate suggestions for this. If contamination of the ventilation system is detected, the WFK can be cleaned with the brush suction method. In vertical systems, the WFK can be cleaned in the built-in ceilings in a single operation.

Due to the exclusion of the use of the WFK in ventilation systems specified by the manufacturer, the installation and maintenance instructions are sufficient to ensure the function in case of ventilation and fire.

² It should be noted that the use of the term „applicant“ is more appropriate. The manufacturer may also allow the application to another person and the sales department with its own application for a CE certificate

7. Special instructions

7.1 Terms

The designations for building materials and building products named by the applicant have been adopted.

7.2 Maintenance conditions

This fire safety assessment does not remove existing requirements for the maintenance of fire safety requirements.

7.3 Use of fire safety assessment

This fire protection assessment describes the building supervisory requirements regarding the maintenance and repair of the fire damper type WFK of Bartholomäus GmbH.

It is in no form a building supervisory proof of usability nor a general proof and is intended for internal use for the preparation of documents and action strategies.

Dachau/München 12. April 2019



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Stellvertretender Leiter des Forschungslabors



Dr. rer. nat. Horst Fark
Leiter des Forschungslabors



8 Appendixes

8.1 Excerpt from DIN EN 15650: 2010; section 8. ff

8. Product information, installation and maintenance (documentation)

8.3 Information on maintenance

The manufacturer shall provide appropriate information for the maintenance of the fire damper, covering at least the following aspects:

- a) inspection and maintenance procedures;
- b) recommended frequency of functional checks;
- c) recommended checks to determine the effects of corrosion.

NOTE: Periodic checks / inspection should be performed according to legal requirements or at intervals not exceeding 6 months. Appendix D contains a detailed example of the method described above. Some automatic systems may allow more frequent checks (48 hour intervals or less) and this may be required by national regulations.

8.2 Excerpt from DIN EN 15650:2010; Appendix D

Appendix D

(informative)

Example of an inspection and maintenance procedure

This appendix has been added to this guide to give guidance on how to inspect and maintain built-in products without qualifying national regulations.

After installation, it is recommended that appropriately qualified on-site personnel perform and record the inspections listed in Table D.1 with the system running. These inspections should be carried out at intervals specified by the manufacturer in his maintenance instructions (see section 8).

Table D.1 — Inspections recommended for fire dampers

| Activity/task | Result |
|--|--------|
| Specification of the damper | |
| Date of the inspection | |
| Check the wiring of the actuator for damage (if applicable) | |
| Check wiring of limit switch for damage (if applicable) | |
| Check the damper for cleanliness and clean if necessary | |
| Check the condition of the fins and seals, correct if necessary and log | |
| Check the safety closing operation of the fire damper according to the manufacturer's instructions | |
| Check that the damper moves to the OPEN and CLOSED positions using the control system and observe the damper; correct and log if necessary | |
| Check the operation of the limit switches for OPEN and CLOSED, correct and log (if necessary) | |
| Check if the damper performs its function as part of the control system (if necessary) | |
| Check that the flap is in its normal working position | |

NOTE A fire damper is usually part of a system. Therefore, the entire system should be inspected according to the operating and maintenance requirements applicable to that system

8.3 Excerpt from DIN EN 15650:2010; section 4ff.

4.1.1 Fire resistance

The fire damper must be fire-resistant, have the following characteristics and be classified according to EN 13501-3:

- a) Room closure: check according to the test procedure in 5.2.2 and classify the room closure (E);
- b) Thermal insulation: shall be tested according to the test procedure in 5.2.2 and the thermal insulation (I) to classify;
- c) Leakage: test according to the test method in 5.2.3 and classify the leakage (S).

4.2 Design and components: characteristics

4.2.1 Design and operation principle

4.2.1.1 General

Fire dampers must have a safety position „fully closed“. This is necessary to maintain section separation.

4.2.1.2 Rated conditions of activation / sensitivity

4.2.1.2.1 General

The units may be open as part of an air conditioning system and must close under the following circumstances:

- In response to an elevated temperature; or
- by external triggering.

Consequently, fire dampers must:

- a) move to and remain in the closed position;
- b) have certain leakage;
- c) contain a thermal tripping device closing the fire damper (also depending on its design), the thermal tripping device using a temperature-sensitive sensor to be tested in accordance with 5.2.5;
- d) be fire-resistant to maintain separation in the closed position.

NOTE A device for opening and closing the fire damper for inspection purposes may be useful and taken into account in the product design. This can be useful if there is no power during startup.

4.2.1.2.2 Response temperature of the temperature-sensitive sensor

The thermal trip device shall be equipped with a temperature-sensitive sensor whose response temperature coincides with the test procedure in 5.2.5 when the temperature rises.

4.2.1.2.3 Load capacity of the temperature-sensitive sensor

The thermal trip device shall be equipped with a temperature-sensitive sensor whose load capacity complies with the test procedure specified in 5.2.5.

4.2.1.3 Response delay: closing time

Any temperature may be used provided that the response time (closing time) of the fire damper is within 2 minutes in accordance with the test procedure in 5.2.4.

4.2.2 Protection against corrosion

If a manufacturer wishes to demonstrate that a fire damper has improved corrosion resistance in salt spray in order to demonstrate the durability of a fire damper, the test described in Annex B shall be carried out and the results of these tests indicated (i. e. passed / failed). Alternatively, this feature may be demonstrated by using and indicating products, components and treatments with known corrosion resistance.

NOTE Except for products used in a corrosive / contaminated environment, there are no corrosion resistance requirements for products for other applications.

8.4 Excerpt from model administrative regulation Technical Building Regulations (MV V TB) Annex A (16)

7.5 Fire dampers according to DIN EN 15650: 2010-09, assignment and conditions of use and execution

At the behest of the owner of the ventilation system, the function of the fire damper must be checked at least every six months, taking into account the basic maintenance measures in accordance with EN 13306 in conjunction with DIN 31051. If two successive tests at intervals of 6 months do not indicate any malfunctions, the fire damper must only be checked at annual intervals.

8.5 Excerpt from DIN EN 13306:2001 (3)

7 Maintenance types and strategies

7.1 Preventive maintenance

Maintenance carried out at fixed intervals or according to prescribed criteria for reducing the probability of failure or the likelihood of a limited functional performance of a unit.

7.2 Planned maintenance

Preventive maintenance performed according to a fixed schedule or number of usage units.

NOTE: Usage units are e. g. production numbers, start numbers, kilometers driven, etc.

7.3 Predetermined maintenance

Preventive maintenance carried out at fixed intervals or after a specified number of use units but without prior status determination.

7.4 Condition-based maintenance

Preventive maintenance, which consists of monitoring the operation and / or the measured quantities that represent it, as well as the following measures.

NOTE: Function and metric monitoring can be on-schedule, on-demand, or continuous.

7.5 Predictive maintenance

Condition-based maintenance performed after a prediction derived from the analysis and determination of parameters characterizing the deterioration of the unit.

7.6 Corrective maintenance

Maintenance, performed after fault detection, to bring a unit into a condition in which it can perform a required function.

7.7 Remote maintenance

Maintenance of a unit, performed without physical access of the personnel to the unit.

7.8 Deferred maintenance

Corrective maintenance that is not performed immediately after an error has been detected, but is deferred according to given maintenance rules.

7.9 Immediate maintenance

Maintenance performed without delay after error detection to avoid unacceptable consequences.

7.10 Maintenance during operation

Maintenance during the time the unit is used.

7.11 Maintenance on site

Maintenance carried out at the place where the unit is used.

7.12 User maintenance

Maintenance performed by an operator.

8 Maintenance activities

8.1 Compliance testing

Check for accordance by measuring, observing, testing or calibrating the relevant characteristics of a unit.

NOTE: In general, the conformity test can be carried out before, during or after other maintenance measures.