



CLASSIFICATION REPORT No. EFR-22-000469

In accordance with standards EN 13501-3/A1:2012 and EN15650:2010

Delivered	11 May 2022 by EFFECTIS France/Notified body n° 1812.
Reference laboratory assessment	<ul style="list-style-type: none">• EFR-22-000469
Concerning	<p>A range of multi-blades fire dampers MARKAGE FD mounted within supporting construction.</p> <ul style="list-style-type: none">- Overall fire-damper dimensions : Minimum : 200 x 200 mm (Wn x Hn) Maximum : 1000 x 2400 mm (Wn x Hn)- Nominal pressure : -300 Pa;- Blades' axis : horizontal or vertical.
Applicant	<p>RF TECHNOLOGIES Lange Ambachtstraat 40 B - 9860 OOSTERZELE</p>

1. INTRODUCTION

The classification report defines the classification assigned to the MARKAGE FD type fire-damper in compliance with the operating procedures given in the standard EN13501-3+ A1:2012 : "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".

2. NOTIFIED BODY

Efectis France
Voie Romaine
F - 57280 MAIZIERES-LES-METZ

Notified body: 1812

3. APPLICANT

RF TECHNOLOGIES
Lange Ambachtstraat 40
B - 9860 OOSTERZELE

4. REFERENCE DOCUMENT

- EFR-21-H-002853
- EFR-21-H-002854
- EFR-22-T-001059

5. REFERENCES AND ORIGIN OF THE ELEMENTS EXAMINED

References: MARKAGE FD

Source: RF TECHNOLOGIES
Lange Ambachtstraat 40
B - 9860 OOSTERZELE

6. PRINCIPLE OF ASSEMBLY

6.1. TYPE OF FUNCTION

MARKAGE FD are defined as "fire dampers". Its function is to resist fire as regards fire integrity, thermal insulation and leakage flow rates given into standard EN 13501-3:2012.

6.2. GENERAL

See appendix.

The studied specimen is a fire damper built into supporting construction, mechanism on fireside or on un-exposed side.

Each damper was constituted as follows:

- An insulated rectangular damper housing;
- Horizontal or vertical axis blades;
- A linkage mechanism and actuators.

The main dimensional characteristics of the fire-damper are as follows:

- Fire damper minimal dimensions : 200 x 200 mm (Wn x Hn),
- Fire damper maximal dimensions : 1000 x 2400 mm (Wn x Hn),
- Nominal pressure : -300 Pa.

6.3. LIST OF THE COMPONENTS

The exact list of the components is available into the laboratory assessment reference EFR-22-000469.

6.4. DETAILED DESCRIPTION OF THE SPECIMEN

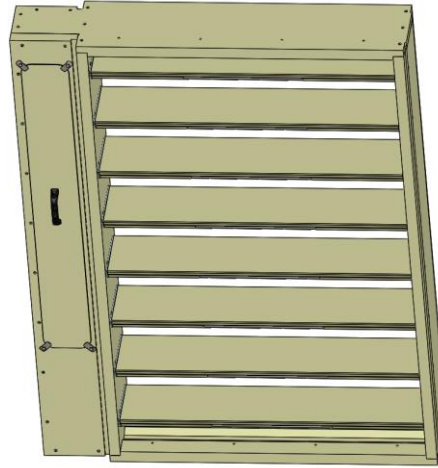
The drawings in the appendix have been supplied by the Sponsor, checked by the test laboratory EFECTIS France, and are in conformity with the tested specimen.

The description below is a light version of the detailed description. See laboratory assessment EFR-22-000469 for the exact description.

6.4.1. Housing

The fire-damper housing is composed of insulated plates in calcium silicate PROMATECT MT (PROMAT) of thickness 40 mm and density 640 kg/m³ making a closed tunnel with inner dimensions Wn x Hn x 250 mm (w x h x L). Wn and Hn are the nominal width and height of the damper. Two additional plates are enclosed between the top and bottom plates, making a cavity which houses the actuation system. A third additional plate closes the cavity and gives access to the actuation system by opening. All plates are screwed towards each other.

The fire-damper cavity for inspection access has one up to three openings, dependent on the size of the damper and the number of actuators. The removable cavity cover has a PA6-GF15 handle.



Both ends of the damper tunnel casing have outer dimensions $(W_n+70) \times (H_n+70)$. These outer dimensions create a connecting flange and received a metal frame 1.25 mm thick for connecting sheet metal duct.

6.4.2. Blades

The damper blades are machined out of 30 mm thick calcium silicate board

6.4.3. Actuating mechanism

The spring return actuator drives the damper blades in the open position and closes automatically when power shuts off or when the sensing element trigs the damper closing.

Three actuators drive the damper blades:

- BFL (BELIMO) actuator
- BFN (BELIMO) actuator
- BF (BELIMO) actuator

The actuators are installed in the damper housing cavity and are accessible through the removable cavity covers.

The actuator is directly powered by an external power source for opening the damper. When power shuts off or when the sensing element is triggered, the actuators and so all damper blades close. Both power and switches cables are passing through the cavity housing by a drilled hole 1 mm larger in diameter than the cable diameter.

The thermoelectric tripping device of BAT type (BELIMO) complies with the specific requirements of the standard ISO 10294-4. If the temperature inside the damper exceeded 72°C , then the temperature fuse responds, the supply voltage was interrupted permanently and irreversibly.

6.5. TEST ASSEMBLY

6.5.1. MARKAGE FD into massive walls, mortar system

The fire-dampers can be built in a concrete wall with:

- Minimum thickness : 100 mm;
- Minimum density : 550 kg/m³.

The element is built within the concrete wall by means of mortar.

The opening made in the wall in order to fit the fire-damper is done with maximal dimensions:

- $(W_{n \text{ fire-damper}} + 375) \times (H_{n \text{ fire-damper}} + 150)$ mm (w x h)
Or
- $(H_{n \text{ fire-damper}} + 150) \times (W_{n \text{ fire-damper}} + 375)$ mm (w x h).

6.5.2. MARKAGE FD into massive walls, WEICHSCHOTT system

The fire-damper can be built in a concrete wall with:

- Minimum thickness : 100 mm;
- Minimum density : 550 kg/m³.

The opening made in the wall in order to fit the fire-damper is done with dimensions:

- $(W_{n \text{ fire-damper}} + 745) \times (H_{n \text{ fire-damper}} + 520)$ mm (w x h).
or
- $(H_{n \text{ fire-damper}} + 520) \times (W_{n \text{ fire-damper}} + 745)$ mm (w x h).

The weichschott sealing was tested with two openings of 400 mm and two openings of 50 mm. This was done in order to validate the use of weichschott from a minimum opening of 50 mm up to 400 mm.

This opening is filled with two layers of single side coated mineral wool boards PROMASTOP® CB CC (PROMAT) density 140 kg/m³. The tightness between boards and between boards and wall/slab is improved with glue PROMASTOP® CC (PROMAT) laid over each side of boards in contact prior to their assembly. After assembly, the overflowing of glue is smoothed with a spatula. A drying time of 16 days has to be respected.

The tested element is built within the weichschott system and maintained in position by glue PROMASTOP® CC (PROMAT) applied between the weichschott and the fire-damper.

6.5.3. MARKAGE FD into flexible supporting construction, WEICHSCHOTT system

The fire-dampers can be installed through a type A, B or C plasterboard supporting construction normalized according to EN 1363-1: 2020, with at least the same fire performances as the fire-damper.

The lightweight wall must be constituted by one to two facing of 12.5 mm thick fire plasterboards (type F according to EN 520 standard) on each side, a cavity isolated by mineral wool of minimum thickness 40 mm, theoretical minimal density of 55 kg/m³ and a frame realized by mild steel studs and rails.

The opening made in the wall in order to fit the fire-damper is done with maximal dimensions:

- $(W_{n \text{ fire-damper}} + 795) \times (H_{n \text{ fire-damper}} + 300)$ mm (w x h)
- Or
- $(H_{n \text{ fire-damper}} + 300) \times (W_{n \text{ fire-damper}} + 795)$ mm (w x h).

Two plasterboards 12.5 mm thick are fixed on the metal studs into the opening, creating an aperture framing.

This opening is filled with two layers of single side coated mineral wool boards PROMASTOP® CB CC (PROMAT) density 140 kg/m³. The tightness between boards and between boards and wall/slab is improved with glue PROMASTOP® CC (PROMAT) laid over each side of boards in contact prior to their assembly. After assembly, the overflowing of glue is smoothed with a spatula. A drying time of 16 days has to be respected.

7. COMPLIANCE WITH THE STANDARD EN 15650

7.1. OPERATIONAL RELIABILITY

In accordance with paragraph 4.3.1 a) of standard NF EN 15650: 2010, the results are given in the reference reports.

Operational reliability: 50 cycles - compliant.

7.2. DURABILITY OF OPERATIONAL RELIABILITY

In accordance with paragraph 4.3.3.2 and appendix C of standard NF EN 15650: 2010, the results are given in reference reports EFR-22-H-002853 and EFR-22-H-002854:

- 10 000 cycles at nominal operating supply, followed by,
- 100 cycles at nominal operating supply less 10 %, followed by,
- 100 cycles at nominal operating supply plus 15 %.

7.3. RESPONSE TIME AND LOAD CAPACITY OF THE THERMAL TRIGGER

In accordance with paragraph 5.2.5 of standard NF EN 15650: 2010 the results are given in the reference reports 3P08908-4 (SP).

8. FIRE RESISTANCE CLASSIFICATIONS

8.1. CLASSIFICATION REFERENCES

This classification procedure is performed in accordance with section 7.2.3 of the standard EN 13501- 3:2012.

8.2. CLASSIFICATIONS

The elements are classified in accordance with the following combinations of performance parameters and classes.

The dimensional range covered by the performances stated below is from 200 x 200 mm to 1000 x 2400 mm for an operating vacuum pressure of - 300Pa.

Fire side: actuator inside or outside fire area.

No other classification is authorised.

8.2.1. MARKAGE FD into massive walls, mortar system

E	I		t		ve	-	ho	-	i	↔	o	-	S
E	I		90		ve	-		-	i	↔	o	-	S

8.2.2. MARKAGE FD into massive walls, WEICHSCHOTT system

E	I		t		ve	-	ho	-	i	↔	o	-	S
E	I		90		ve	-		-	i	↔	o	-	S

8.2.3. MARKAGE FD into flexible supporting construction, WEICHSCHOTT system

E	I		t		ve	-	ho	-	i	↔	o		-	S
E	I		90		ve	-		-	i	↔	o		-	S

9. SCOPE OF APPLICATION OF THE RESULTS

9.1. GENERAL POINTS

The requirements related to the scope of application of all the fire dampers tested in accordance with EN 1366-2 apply, as well as the following items.

9.2. DIMENSIONS OF THE FIRE DAMPER

In accordance with section 13.1 of the standard EN 1366-2, the classifications indicated in the classification report are valid for all fire dampers of the same type (including all the side reports), provided the maximum flow cross-section dimensions do not exceed 1000 x 2400 mm and that the minimum flow cross-section dimensions are not less than 200 x 200 mm.

9.3. SEPARATION BETWEEN FIRE DAMPERS AND BETWEEN FIRE DAMPERS AND CONSTRUCTION ELEMENTS

A test result obtained for only one fire damper or for two fire dampers with a minimum clear separation of 200 mm is applicable to a minimum separation in practice of:

- a. 200 mm between fire dampers installed in separate ducts;
- b. 75 mm between fire damper and a construction element (wall/floor) – e.g. for a damper in a wall, this is the distance between the damper casing (largest dimension) mounted in the supporting construction and a wall or floor adjacent to that supporting construction.

9.4. SUPPORTING CONSTRUCTIONS

A test obtained for a fire damper mounted in or on the face of a standard supporting construction is applicable to a supporting construction of the same type with a fire resistance equal to or greater than that of the standard supporting construction used in the test (thicker, denser, more layers of board, as appropriate).

The test result can also apply to cellular or hollow masonry blocks or slabs that have a fire resistance time equal or greater than the fire resistance required for the fire damper installation.

Test results obtained with dampers installed in flexible vertical supporting constructions may be applied to rigid supporting constructions of a thickness equal to or greater than that of the element used in the tests, provided that the classified fire resistance of the rigid supporting construction is greater than or equal to the one used for the test. The sealants used shall be the same as those tested. Any fasteners used shall be fire rated to suit the supporting construction that is used.

Test results obtained with dampers installed in insulated flexible vertical supporting constructions may be applied to applications where the same flexible vertical supporting construction is uninsulated (less onerous as per EN 1363-1) – aperture framing shall be used using the same materials as used in the test partition construction, using the same number of boards as was tested.

Test results obtained with dampers installed in flexible vertical supporting constructions made with steel studs are not applicable to flexible vertical supporting constructions made using timber studs.

Test results obtained with dampers installed in aerated concrete are applicable to rigid constructions made from hollow blocks, provided that the holes are filled/closed before the addition of the final penetration seal. If a specific supporting construction different from those described in 7.2 is selected, the test results obtained are applicable only to that specific wall, partition or floor having a thickness and/or density equal or greater than that tested.

10. RESTRICTIONS

This classification document does not represent type approval or certification of the product.

These conclusions only relate to the fire resistance performances of the elements covered by this document. They are without prejudice, in any case, to other performances related to their use in a structure.

Maizières-lès-Metz, 11 May 2022

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Charlotte SCHNELLER

Project leader

Signé par : Charlotte SCHNELLER

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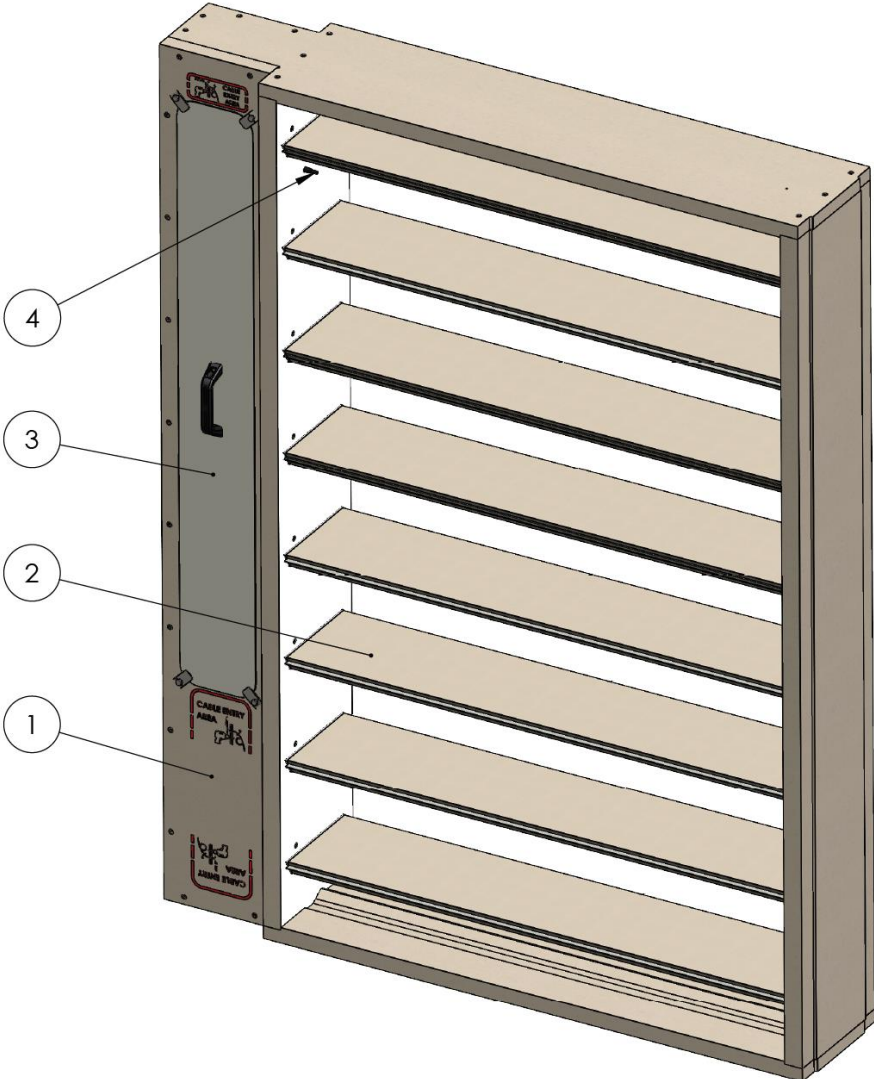

Romain STOUVENOT

Supervisor

Signé par : Romain STOUVENOT

APPENDIX: DRAWINGS



 <p>www.rf-t.be</p>	<p>Reference - Subject - Date MAC_COMMERCIAL_08-07-2021</p>	<p>Plate A 2/2</p>
		
<p>MAIN PARTS</p> <ol style="list-style-type: none"> 1. Frame in calcium silicate refractory board 2. Damper blade 3. Hatch + handle to actuator and controller compartment 4. Thermal fuse 		
<p><u>Plan Title:</u></p>		