

**FIRE RESISTANCE EXPERT JUDGEMENT REPORT
WITH CLASSIFICATION FIRES-JR-004-16-NURE**

**Loft shutter with retractable steel ladder, type LMF with fire resistance
EI₁ 60, EI₂ 120**

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FIRE RESISTANCE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION

FIRES-JR-004-16-NURE

Name of the product: Loft shutter with retractable steel ladder, type LMF with fire resistance
EI₁ 60, EI₂ 120

Sponsor: FAKRO Sp z o.o.
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1. INTRODUCTION

This expert judgement report with classification defines the resistance to fire classification assigned to loft shutter with retractable steel ladder, type LMF.

Standard EN 1634-1: 2014 specifies a method for determining the fire resistance of door and shutter assemblies and openable windows designed for installation within openings incorporated in vertical separating elements. In comparison with EN 1634-1: 2008, actual version of standard EN 1634-1 does not comment the possibility of using this test method to determine the fire resistance of non-loadbearing horizontally oriented doors/shutters by analogy. As there is no test method to determine the fire resistance of such products, FIRES, s.r.o. chose EN 1634-1: 2014 paragraph 13 to define the field of application of test results [1]. This expert judgement expresses the opinion of the FIRES and is based on the experience or internal rules of FIRES.

Fire resistance expert judgement report FIRES-JR-004-11-NURE had been issued for the loft shutter with retractable steel ladder, type LMF on 31.01.2011. Validity of that document expired on 31.01.2016. On 01.02.2016 a report FIRES-JR-004-16-NURE was published in order to replace an expert judgement report FIRES-JR-004-11-NURE.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The element is used as a shutter with fire separating function fixed in the ceiling of houses, administrative and polyfunctional buildings.

2.2 PRODUCT DESCRIPTION

Dimensions

overall dimensions of the shutter	(897 x 1335) mm (width x length)
flap dimensions	(825 x 1262) mm (width x length)
dimensions of opening	(800 x 1240) mm (width x length)

Fixed frame of shutter

Frame of shutter is made of profiled steel sheets of thickness 1,5 mm (bottom part of the frame) and thickness 2 mm (upper part of the frame) as well as 20 mm thick board PROMATECT®-H (produced by Promat TOP Sp z o.o., PL).

Flap

Core of the flap consist of:

- 2x 20 mm thick boards of mineral wool ROCKWOOL CONLIT 150 P with bulk density 150 kg/m³ (producer: ROCKWOOL POLSKA Sp z o.o., PL);
- 2x 20 mm thick boards of mineral wool ROCKWOOL FASROCK with bulk density 135 kg/m³ (producer: ROCKWOOL POLSKA Sp z o.o., PL).

The closing cap is made of 1 mm thick profiled steel sheet. Side edges of flap are made of perforated steel sheet of thickness 1 mm.

Ladder and hardware

- steel folding sector ladder;
- two hinges placed 80 mm from edges of flap;
- lock placed against the hinges in the middle of flap width;

Intumescent tapes

KERAFIX FLEXTREM 100 (produced by GLUSKE GmbH, D) - 1 stripe (2 x 60) mm (thickness x width) or 3 stripes (2 x 20) mm (thickness x width) is/ are placed along the perimeter of shutter flap.

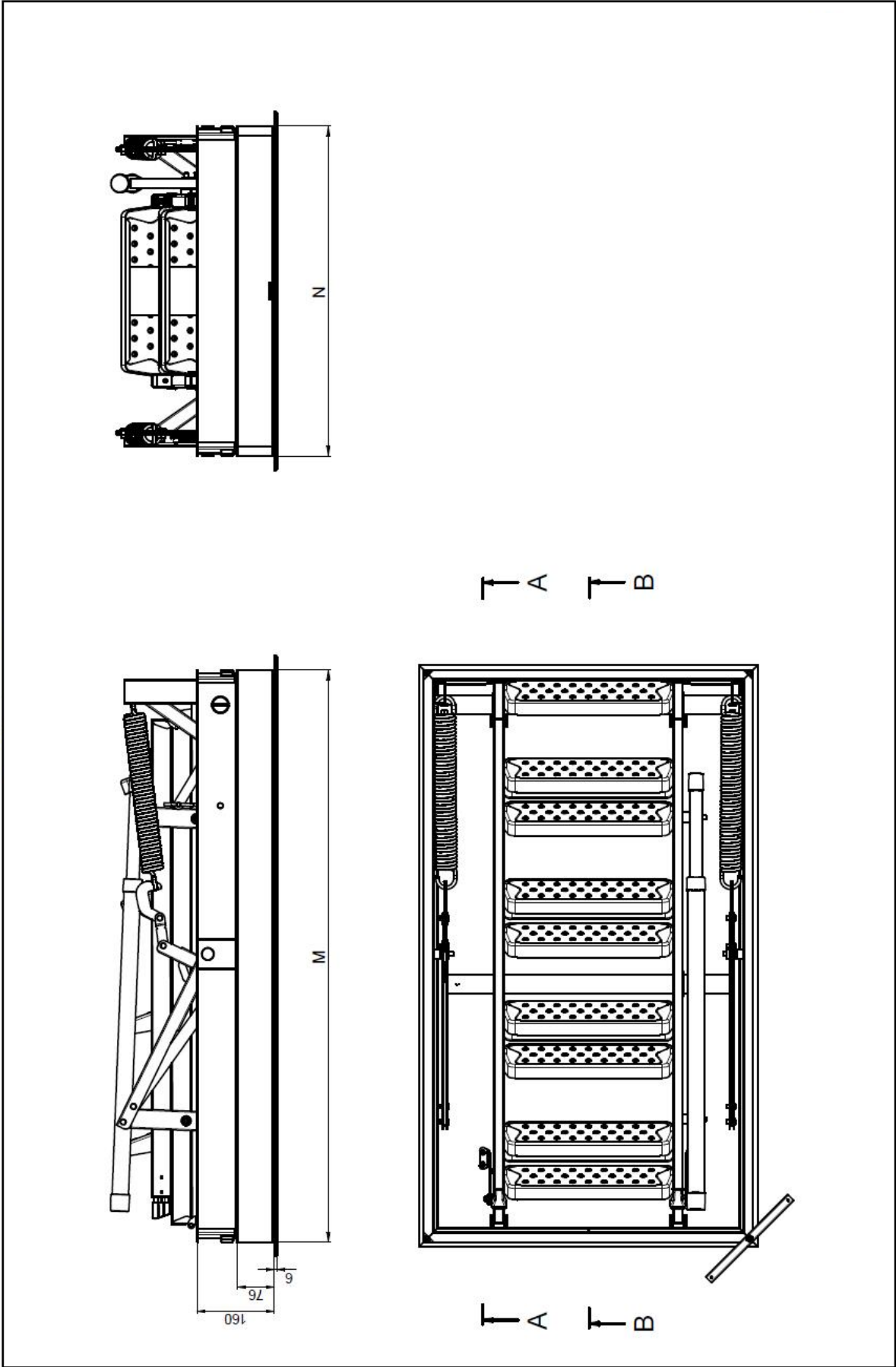
Sealing - system silicone sealing is placed along the perimeter of fixed frame.

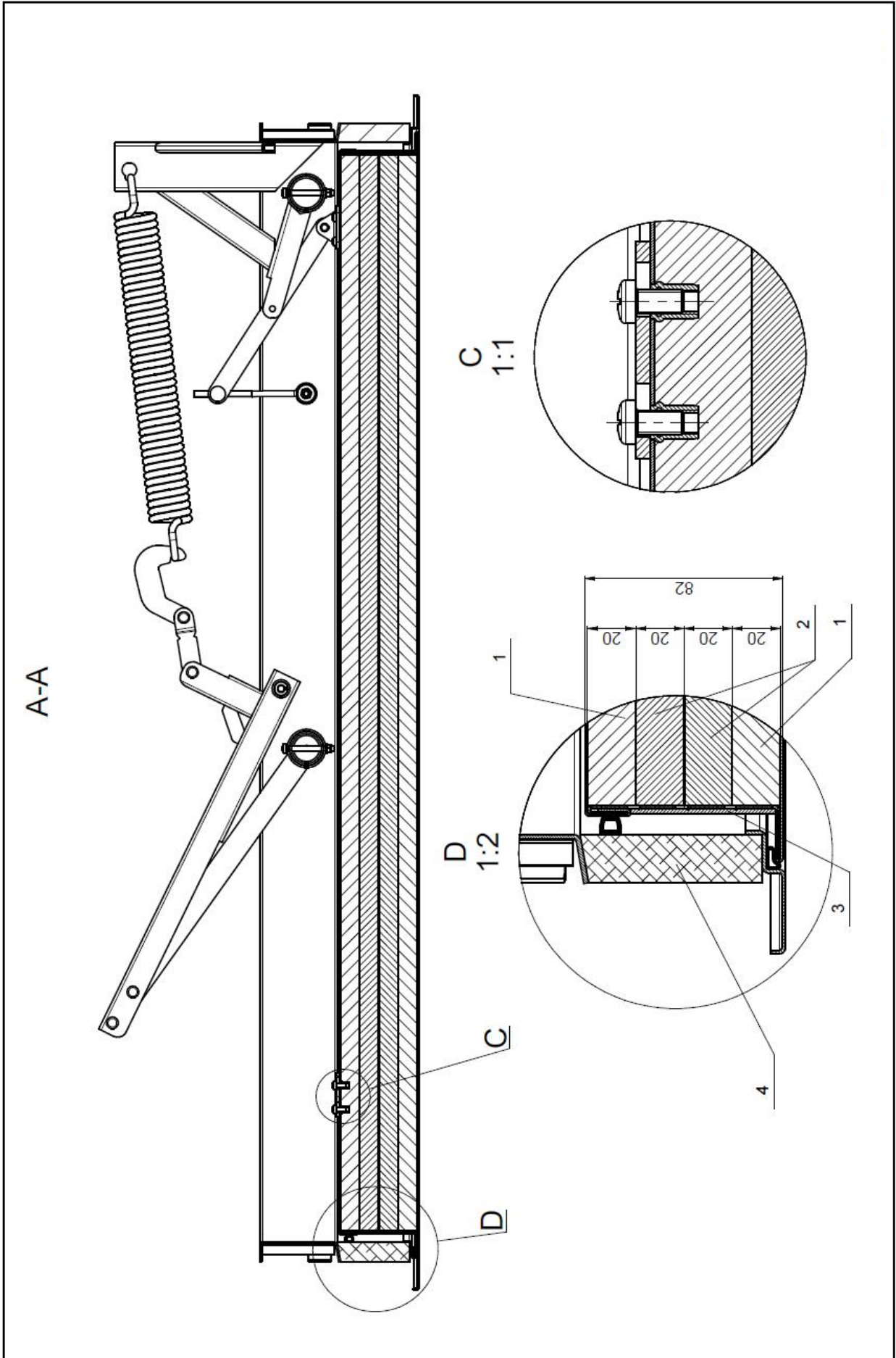


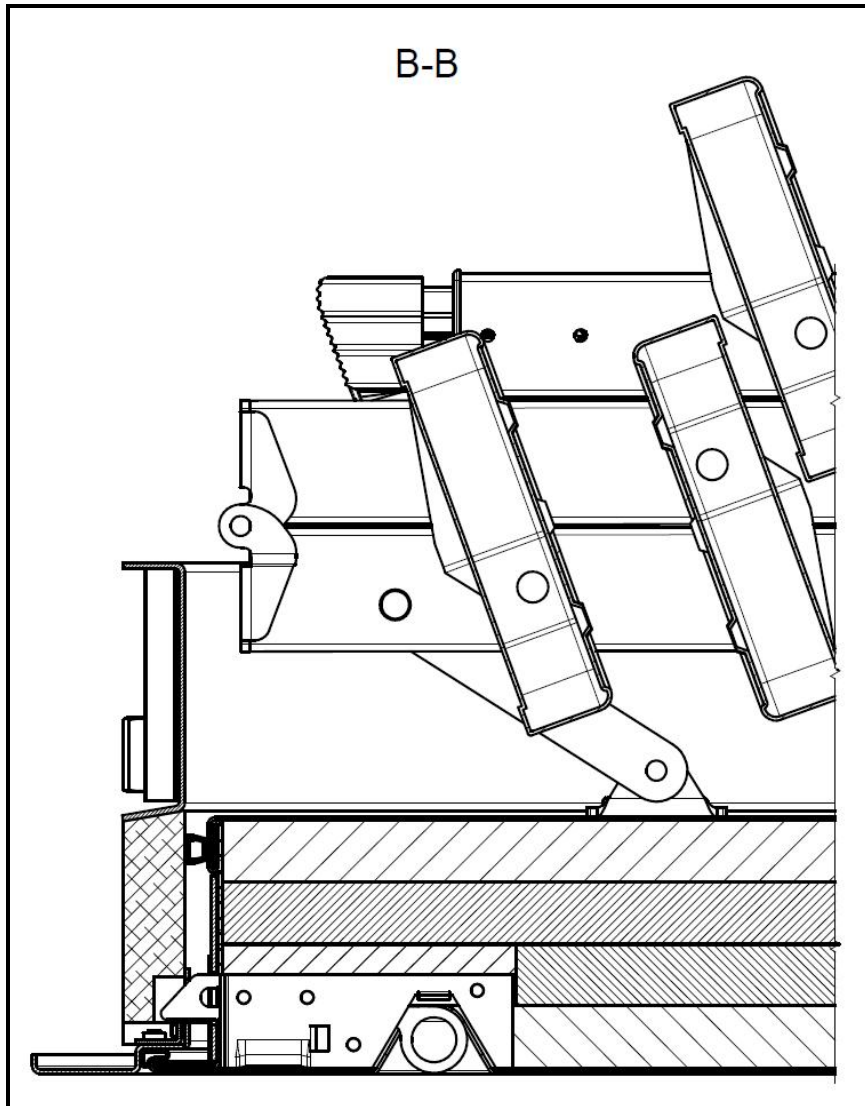
View on fixed frame of the shutter
Sealing



Intumescent tapes KERAFIX FLEXTREM 100 (produced by GLUSKE GmbH, D):
1 stripe (2 x 60) mm (thickness x width) or 3 stripes (2 x 20) mm (thickness x width).







More detailed information about construction of product is shown in the test report [1].

2.3 PRODUCT FIXATION

The shutter is fixed in rigid supporting construction with minimum thickness 250 mm and minimum bulk density 613 kg/m^3 by means of threaded bars M8 and washers with nuts placed in product corners. Gap of thickness circa 20 mm between the frame and supporting construction is filled by mineral wool. Fixed frame is also sealed in contact with supporting construction by fire resistant putty INTUMEX from both sides of shutter.



3. TEST REPORTS AND EXTENDED APPLICATION REPORTS IN SUPPORT OF CLASSIFICATION

3.1 TEST REPORTS

No.	Name of laboratory	Name of sponsor	Test report No.	Date of the test	Test method
[1]	FIRES, s.r.o., Batizovce, Slovakia	FAKRO Sp z o.o. Nowy Sącz, Poland	FIRES-FR- 216-10-AUNS	07.12.2010	EN 1634-1: 2008

[1] Test specimens were conditioned according to STN EN 1363-1 before the fire resistance test.

3.2 TEST RESULTS

No./ Test method	Parameter	Results	
[1] EN 1634-1: 2008	applied load	-	
	supporting construction	ceiling made of aerated concrete blocks, thickness 250 mm, bulk density 613 kg/m ³	
	temperature curve	standard temperature time curve	
	loadbearing capacity	-	
	integrity	cotton pad	121 minutes no failure
		gap gauges	121 minutes no failure
		sustained flaming	121 minutes no failure
	thermal insulation	l ₁	63 minutes
		l ₂	121 minutes no failure
	radiation	121 minutes no failure	
	self closing	25 cycles	
other parameters	Orientation of specimens during the test: Opening of shutter in direction from heat exposure, stairs on the exposed specimen face		
[1] EN 1634-1: 2008	applied load	-	
	supporting construction	ceiling made of aerated concrete blocks, thickness 250 mm, bulk density 613 kg/m ³	
	temperature curve	standard temperature time curve	
	loadbearing capacity	-	
	integrity	cotton pad	121 minutes no failure
		gap gauges	121 minutes no failure
		sustained flaming	121 minutes no failure
	thermal insulation	l ₁	88 minutes
		l ₂	121 minutes no failure
	radiation	121 minutes no failure	
	self closing	25 cycles	
other parameters	Orientation of specimens during the test: Opening of shutter in direction to heat exposure, stairs on the unexposed specimen face		

[1] The test was discontinued in 122th minute at the request of test sponsor.



4. CHANGES OF THE PRODUCT OR END USE CONDITIONS OUTSIDE OF THE FIELD OF DIRECT OR EXTENDED APPLICATION

Following changes of the product or end use conditions were permitted:

1. Substitution of mineral wool ROCKWOOL CONLIT 150 P (produced by ROCKWOOL POLSKA Sp z o.o., PL) by another type of mineral wool (e.g. PAROCK FPS 17 t produced by PAROC POLSKA SP. z o.o., PL, etc.).
2. Substitution of mineral wool ROCKWOOL FASROCK (produced by ROCKWOOL POLSKA Sp z o.o., PL) by another type of mineral wool (e.g. PAROCK FAB 3 produced by PAROC POLSKA SP. z o.o., PL, etc.).
3. The field of application of test results [1] based on EN 1634-1: 2014, paragraph 13.

5. ARGUMENTS IN FAVOR OF THE EXTENSION

Change 1 and 2

Substitution of ROCKWOOL CONLIT 150 P as well as ROCKWOOL FASROCK by another type of mineral wool is allowed on conditions that alternative insulation has the following parameters:

- thickness is 2 x 20 mm;
- bulk density is 150 -170 kg/m³ (if ROCKWOOL CONLIT 150 P is substituted);
- bulk density is 135 - 160 kg/m³ (if ROCKWOOL FASROCK is substituted);
- reaction to fire classification acc. to EN 13501-1 is A1.

Change 3

In comparison with EN 1634-1: 2008, actual version of standard EN 1634-1: 2014 does not comment the possibility of using this test method to determine the fire resistance of non-loadbearing horizontally oriented doors/shutters by analogy. As there is no test method to determine the fire resistance of such products, FIRES, s.r.o. chose EN 1634-1: 2014 paragraph 13 to define the field of application of test results [1]. The judge, FIRES, s.r.o. does not suppose that product changes (described in clause 6.2) based on field of application in EN 1634-1: 2014 could lead to the decrease in fire resistance of product.

6. CLASSIFICATION AND FIELD OF APPLICATION

6.1 CLASSIFICATION

Loft shutter with retractable steel ladder, type LMF is classified according to the following combinations of performance parameters and classes as appropriate.

Fire resistance classification:
E 120-C0/ EI₁ 60-C0/ EI₂ 120-C0/ EW 60-C0*

* Standard EN 13501-2, paragraph 7.5.5.4 does not define the class EW 120 (only EW 20, EW 30, EW 60). Product fulfills criteria of integrity as well as radiation during 120 minutes of fire.



6.2 FIELD OF APPLICATION

This classification is valid for the following end use applications:

Product dimensions	<ul style="list-style-type: none"> - increase in product dimensions: 15% length, 15% width, 20% product area on conditions: <ul style="list-style-type: none"> • fire resistance classification is changed in the following way: E 90-C0 / EI₁ 45-C0 / EI₂ 90-C0 / EW 60-C0; • amount of fixings (used to fasten the product to the supporting construction) i.e. threaded bars M8 + washers + nuts shall be increased in such way that tension in the fixing is not higher than during the test [1]; • lock is always placed in the middle of flap width; • the distance between the hinges and flap edge shall be maximum 80 mm; - decrease in product dimensions to 50% of product width and to 75% of product length; <p>For smaller sizes the relative positioning of movement restrictors (e.g. hinges, latches, etc.) shall remain the same as during test [1] or any change to the distances between them will be limited to the same percentage reduction as the decrease of product size.</p>
Material and construction	<ul style="list-style-type: none"> - dimensions of metal wrap around frame may be increased to accommodate increased supporting construction thickness; - the thickness of the metal may also be increased by up to 25%; - alternative mineral wool used as a core of the flap on conditions defined in cl. 5 of the document;
Decorative finishes	<ul style="list-style-type: none"> - where the paint finish is not expected to contribute to the fire resistance of the product alternative paints are acceptable and may be added to flap or frame; - decorative laminates and timber veneer up to 1,5 mm thickness may be added to the faces (but not edges) of flap and frame;
Fixings	<ul style="list-style-type: none"> - the number of fixings used to attach the shutter to the supporting constructions may be increased but shall not be decreased and the distance between the fixings may be reduced but shall not be increased;

7. LIMITATIONS

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

The classification is valid until 01. 02. 2021 provided that the product, field of application and standards and regulations are not changed.

Approved:

Signed:

Ing. Štefan Rástocký
leader of the testing laboratory



Ing. Henrieta Lapková
technician of the testing laboratory