

FIRE RESISTANCE CLASSIFICATION REPORT No. 22976F



OWNER OF THE CLASSIFICATION REPORT

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INTRODUCTION

This classification report defines the classification assigned to a fire damper (type: CRS-60), in accordance with the procedures given in EN 13501-3:2025: 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 resistant ventilation ducts and fire dampers and/or power, control and communication cables.

This classification report consists of 41 pages and 2 annexes and may only be used or reproduced in its entirety.

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1 Details of classified product

1.1 General

The element, type: CRS-60, is defined as a fire damper with fire resistance characteristics. Its function is to resist fire in respect of integrity, insulation and resistance to smoke leakage for a 60-minute duration.

1.2 Description

The classified product is described below, together with the relevant technical specifications. The description below is a reproduction of the technical files and/or test reports, including the nominal dimensions, provided by the customer. Technical drawings of the dampers are enclosed in annexes 1 till 2.

The exact composition and exposure conditions of the classified products as tested are fully described in the test reports in support of this classification listed in Clause 2.

1.2.1 Fire dampers

1.2.1.1 CRS-60 (100 mm till 315 mm)

1.2.1.1.1 Damper housing

Steel casing	
Material	Galvanised steel
Length	210 mm
Outer diameter	314 mm (NV)
Damper blade stop	
Type	Round tube
Material	Steel
Sealing at the Collar side	
Material	EPDM Rubber
Intumescent strip at the Collar side	
Material	Graphite
Sealing at the Actuator side	
Material	EPDM Rubber
Size	U shape 12 mm x 9 mm x 2 mm
Insulation of the housing at the Actuator side	
Material	Corrugated cardboard

1.2.1.1.2 Damper blade

Damper blade	
Diameter	302 mm
Material	Two steel plates Silicone sheet One Gypsum board Graphite strips two axles
Thickness	14.1 mm (NV)
Axis	
Material	Steel

1.2.1.1.3 Collar

Collar	
Thickness	60 mm
Diameter	415 mm
Composed of	Two gypsum rings 2 brackets Steel strip

1.2.1.2 CRS-60 (400 mm till 630 mm)

1.2.1.2.1 Damper housing

Steel casing	
Material	Galvanised steel
Length	210 mm
Outer diameter	629 mm (NV)
Damper blade stop	
Type	Round tube
Material	Steel
Sealing at the Collar side	
Material	EPDM Rubber
Intumescent strip at the Collar side	
Material	Graphite
Sealing at the Actuator side	
Material	EPDM Rubber
Insulation of the housing at the Actuator side	
Material	Corrugated cardboard

1.2.1.2.2 Damper blade

Damper blade	
Diameter	617 mm
Material	Two steel plates Silicone sheet One Gypsum board Graphite strips two axles
Thickness	26.6 mm (NV)
Axis	
Material	Steel

1.2.1.2.3 Collar

Collar	
Thickness	60 mm
Diameter	730 mm
Composed of	Two gypsum rings 4 brackets Steel strip

1.2.2 Actuators

1.2.2.1 One L (valid for -300 Pa)

Actuator	
Type	ONE L (RFT)
Fixing	To the steel casing by means of a steel support and 2 steel bolts (M6)

1.2.2.2 BFN (valid for -300 Pa)

Actuator	
Type	BFN (Belimo)
Fixing	To the steel casing by means of a steel support and 2 steel bolts (M6)

1.2.2.3 BFL (valid for -300 Pa)

Actuator	
Type	BFL (Belimo)
Fixing	To the steel casing by means of a steel support and 2 steel bolts (M6)

1.2.2.4 UNIQ ME-TA L (valid for -300 Pa and -500 Pa)

Actuator	
Type	UNIQ ME-TA L (RFT)
Fixing	To the steel casing by means of a steel support and 2 steel bolts (M6)

1.2.3 Penetration seals

1.2.3.1 25 mm stuffed stone wool covered with acryl (valid for -300 Pa and -500 Pa)

Stuffed stone wool	
Type	Rockwool Rocksono Extra
Material	Rockwool
Filled distance between the wall and the damper	25 mm
Position	Between the supporting construction and the duct/damper over the entire wall thickness
Acryl	
Type	Soudal Firecryl FR
Material	Fire rated acrylic sealant
Position	On the rockwool penetration seal

1.2.3.2 5 mm acryl (valid for -300 Pa and -500 Pa)

Acryl	
Type	Soudal Firecryl FR
Material	Fire rated acrylic sealant
Filled distance between the wall and the damper	5 mm
Position	Between the supporting construction and the duct/damper

1.2.3.3 Promastop CC-CB coated boards with Firecryl FR (valid for -300 Pa)

Coated board	
Type	Promastop-CC-CB (PROMAT) coated board (1 side coated)
Material	Coated stone wool plates
Board thickness	50 mm
Number of boards	2
Maximum aperture opening in the wall	1230 mm (w) x 1230 mm (h)
Density	140 kg/m ³ (NV)
Sealing + coating	Promastop CC
Position	Between the flexible wall and the duct over the entire wall thickness

Acryl	
Type	Soudal Firecryl FR
Material	Fire rated acrylic sealant
Position	between the Promastop boards and the damper

1.2.3.4 Hilti CFS-CT B coated boards with Firecryl FR (valid for -300 Pa)

Coated board	
Type	CFS-CT B (HILTI) coated board (1 side coated)
Material	Coated stone wool plates
Board thickness	50 mm
Number of boards	2
Maximum aperture opening in the wall	1230 mm (w) x 1230 mm (h)
Density	140 kg/m ³ (NV)
Sealing + coating	CFS-CT coating (HILTI)
Position	Between the flexible wall and the duct over the entire wall thickness
Acryl	
Type	Soudal Firecryl FR
Material	Fire rated acrylic sealant
Position	between the coated boards and the damper

1.2.3.5 Gypsum seal (valid for -300 Pa)

Acryl	
Type	Knauf Goldband K2572
Material	Gypsum
Filled distance between the wall and the damper	40 mm
Position	Between the flexible wall and the damper over the entire wall thickness

1.2.3.6 Mortar seal (valid for -300 Pa)

Mortar	
Type	Any mortar in accordance with EN 998-2 up to M20
Material	Mortar
Filled distance between the wall and the damper	40 mm
Position	Between the flexible wall and the damper over the entire wall thickness

1.2.3.7 Clustered dampers (valid for -300 Pa)

The largest fire damper was tested with a 5 mm acryl seal with a minimum distance of 10 mm from each other and a minimum distance of 10 mm from the surrounding supporting construction.

1.2.4 Installation methods

1.2.4.1 On the wall/floor (valid for -300 Pa and -500 Pa)

The fire damper was tested installed on the wall/floor, both with the damper inside and outside the furnace.

1.2.4.2 Remote from the wall (valid for -300 Pa)

The fire damper was tested installed remote from the wall/floor, both with the damper inside and outside the furnace. The duct connecting the fire damper to the wall was insulated with 70 mm Paroc Hvac Fire Mat BlackCoat or 80 mm Rockwool Conlit Fire Mat.

Paroc insulation	
Type	Paroc Hvac Fire Mat BlackCoat ($\lambda_{10} = 0.036 \text{ W/mK}$)
Thickness	70 mm
Density	90 kg/m ³ (NV)
Rockwool insulation	
Type	Rockwool Conlit Fire Mat ($\lambda_{10} = 0.035 \text{ W/mK}$)
Thickness	80 mm
Density	80 kg/m ³ (NV)

1.2.5 Supporting constructions

1.2.5.1 Flexible wall (valid for -300 Pa and -500 Pa)

Flexible wall	
Type	Flexible partition wall
Thickness	≥ 100 mm
Boards	≥ 2 layers of gypsum boards (thickness: ≥ 12.5 mm) on each side
Metal studs	Richter system EN 14195 50 mm
Internal insulation	Stone wool

1.2.5.2 Shaft wall (valid for -300 Pa)

Flexible shaft wall	
Type	Flexible shaft wall
Thickness	≥ 80 mm
Boards	≥ 2 layers of gypsum boards (thickness: ≥ 15 mm, density: ≥ 820 kg/m ³ (NV) on the exposed side No boards on the unexposed side
Metal studs	Richter system EN14195 50 mm
Internal insulation	Rockwool Rocksono Extra (thickness: ≥ 40 mm, density: ≥ 55 kg/m ³ (NV)

1.2.5.3 Rigid wall (valid for -300 Pa and -500 Pa)

Rigid wall	
Type	Masonry wall
Thickness	≥ 100 mm
Density	≥ 550 kg/m ³ (NV)

1.2.5.4 Rigid floor (valid for -300 Pa and -500 Pa)

Rigid floor	
Type	Aerated concrete
Thickness	≥ 100 mm
Density	≥ 550 kg/m ³ (NV)

2 Test reports/EXAP reports and test results in support of the classification

2.1 Test and EXAP reports

Name of the laboratory	Report ref. no.	Name of the owner	Date of the test	Method
WFRGENT nv	18879A	RF- TECHNOLOGIES NV	28 February 2018	EN 1366-2:2015
WFRGENT nv	21573A	RF- TECHNOLOGIES NV	30 November 2021	EN 1366-2:2015
WFRGENT nv	21574A	RF- TECHNOLOGIES NV	3 December 2021	EN 1366-2:2015
WFRGENT nv	21727A	RF- TECHNOLOGIES NV	1 February 2022	EN 1366-2:2015
WFRGENT nv	21738A	RF- TECHNOLOGIES NV	8 March 2022	EN 1366-2:2015
Efectis Nederland BV	2022- Efectis- R000658	RF- TECHNOLOGIES NV	10 March 2022	EN 1366-2:2015
Efectis Nederland BV	2022- Efectis- R000659	RF- TECHNOLOGIES NV	14 April 2022	EN 1366-2:2015
WFRGENT nv	21929A	RF- TECHNOLOGIES NV	15 April 2022	EN 1366-2:2015
WFRGENT nv	21992A	RF- TECHNOLOGIES NV	4 May 2022	EN 1366-2:2015

Name of the laboratory	Report ref. no.	Name of the owner	Date of the test	Method
WFRGENT nv	21993A	RF- TECHNOLOGIES NV	6 May 2022	EN 1366-2:2015
WFRGENT nv	22157A	RF- TECHNOLOGIES NV	8 June 2022	EN 1366-2:2015
Efectis Nederland BV	2022- Efectis- R000660	RF- TECHNOLOGIES NV	22 June 2022	EN 1366-2:2015
WFRGENT nv	22299A	RF- TECHNOLOGIES NV	9 September 2022	EN 1366-2:2015
WFRGENT nv	22328A	RF- TECHNOLOGIES NV	13 September 2022	EN 1366-2:2015
WFRGENT nv	22328B	RF- TECHNOLOGIES NV	13 September 2022	EN 1366-2:2015
LGAi Technological Center, S.A.	22/32306738	RF TECHNOLOGIES, S.A.	18 November 2022	EN 1366-2:2015
WFRGENT nv	22045A	RF- TECHNOLOGIES NV	25 April 2022	EN 1366-2:2015
WFRGENT nv	22045B	RF- TECHNOLOGIES NV	25 April 2022	EN 1366-2:2015
WFRGENT nv	22045C	RF- TECHNOLOGIES NV	11 May 2022	EN 15650:2010

Name of the laboratory	Report ref. no.	Name of the owner	Date of the test	Method
WFRGENT nv	22045D	RF- TECHNOLOGIES NV	11 May 2022	EN 15650:2010
WFRGENT nv	22631A	RF- TECHNOLOGIES NV	10 January 2023	EN 15650:2010
WFRGENT nv	22631B	RF- TECHNOLOGIES NV	10 January 2023	EN 15650:2010
WFRGENT nv	22976A	RF- TECHNOLOGIES NV	N/A	EN 15882-2:2022
Efectis France	EFR-23-Zn- 003702	RF- TECHNOLOGIES NV	27 September 2023	EN 1366-2:2015
Efectis France	EFR-24-Zn- 001622-1	RF- TECHNOLOGIES NV	23 April 2024	EN 1366-2:2015
Efectis France	EFR-24-Zn- 001707	RF- TECHNOLOGIES NV	15 January 2025	EN 1366-2:2015
Efectis France	EFR-25-U- 002281-1	RF- TECHNOLOGIES NV	8 October 2025	EN 1366-2:2015
Efectis France	EFR-25-Zn- 004396-1	Rf-Technologies NV	23 September 2025	EN 1366-2:2015
Efectis France	EFR-24-Zn- 003373-1	Rf-Technologies NV	17 September 2025	EN 1366-2:2015
Efectis France	EFR-26-Zn- 000137-1 Revision 2	Rf-Technologies NV	31 March 2026	EN 15650:2010

Exposure conditions during the fire resistance test (ref. No. 18879A):

Test standard: EN 1366-2:2015 ;
Deviations: none;
Temperature/time curve: standard as in EN 1363-1: 2012*;
Working pressure: -300 Pa;
Position: inside the furnace;
Supporting construction: flexible wall.

* A comparison between versions of the European Standard EN 1363-1:2012 and EN 1363-1:2020 shows that the temperature/time curve is identical.

Exposure conditions during the fire resistance test (ref. Nos. 21573A, 21574A, 21727A, 21738A):

Test standard: EN 1366-2:2015;
Deviations: The thickness of the connecting duct is smaller than allowed by the standard (0.8 mm vs 1.5 mm $\pm$ 0.1 mm). The thermal conductivity of this duct will be higher and therefor more critical;
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: inside and outside the furnace;
Supporting construction: flexible wall.

Exposure conditions during the fire resistance test (ref. No. 2022-Efectis-R000658):

Test standard: EN 1366-2:2015 ;
Deviations: none;
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: inside and outside the furnace;
Supporting construction: flexible wall.

Exposure conditions during the fire resistance test (ref. No. 2022-Efectis-R000659):

Test standard: EN 1366-2:2015 ;
Deviations: none;
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: outside the furnace;
Supporting construction: flexible wall.

Exposure conditions during the fire resistance test (ref. No. 21929A):

Test standard: EN 1366-2:2015 ;
Deviations: The thickness of the connecting duct is smaller than allowed by the standard (0.7 mm vs 1.5 mm $\pm$ 0.1 mm). The thermal conductivity of this duct will be higher and therefor more critical;
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: inside the furnace;
Supporting construction: flexible wall.

Exposure conditions during the fire resistance test (ref. Nos. 21992A, 21993A):

Test standard: EN 1366-2:2015 ;
Deviations: The thickness of the connecting duct is smaller than allowed by the standard (0.7 mm vs 1.5 mm $\pm$ 0.1 mm). The thermal conductivity of this duct will be higher and therefor more critical;
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: inside and outside the furnace;
Supporting construction: rigid floor.

Exposure conditions during the fire resistance test (ref. No 22157A):

Test standard: EN 1366-2:2015 ;
Deviations: The thickness of the connecting duct is smaller than allowed by the standard (0.7 mm vs 1.5 mm $\pm$ 0.1 mm). The thermal conductivity of this duct will be higher and therefor more critical;
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: inside the furnace;
Supporting construction: flexible shaft wall.

Exposure conditions during the fire resistance test (ref. No. 2022-Efectis-R000660, EFR-23-Zn-003702):

Test standard: EN 1366-2:2015 ;
Deviations: none;
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: outside the furnace;
Supporting construction: flexible shaft wall.

Exposure conditions during the fire resistance test (ref. No. 22299A):

Test standard: EN 1366-2:2015 ;
Deviations: The thickness of the connecting duct is smaller than allowed by the standard (0.7 mm vs 1.5 mm $\pm$ 0.1 mm). The thermal conductivity of this duct will be higher and therefor more critical;
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: outside the furnace;
Supporting construction: rigid floor.

Exposure conditions during the fire resistance test (ref. Nos. 22328A, 22328B):

Test standard: EN 1366-2:2015 ;
Deviations: The thickness of the connecting duct is smaller than allowed by the standard (0.7 mm vs 1.5 mm $\pm$ 0.1 mm). The thermal conductivity of this duct will be higher and therefor more critical;
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: outside the furnace;
Supporting construction: flexible wall.

Exposure conditions during the fire resistance test (ref. No. 22/32306738):

Test standard: EN 1366-2:2015 ;
Deviations: The position and spacers of the dampers is more critical than prescribed by the standard.
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: outside the furnace;
Supporting construction: flexible wall.

Exposure conditions during the cold leakage test (ref. No. 22045A, 22045B):

Test standard: §10.3 of EN 1366-2:2015;
Working pressure: -300 Pa and -500 Pa.

Exposure conditions during the cycle test (ref. Nos. 22045C, 22045D, 22631A, 22631B, EFR-26-Zn-005928-1):

Test standard: EN 15650:2010 Annex C;
Deviations: none;

Exposure conditions during the fire resistance test (ref. No. EFR-24-Zn-001622-1):

Test standard: EN 1366-2:2015 ;
Deviations: the furnace pressure was slightly in excess of the prescribed limitations.
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: outside the furnace;
Supporting construction: flexible wall.

Exposure conditions during the fire resistance test (ref. No. EFR-24-Zn-001707):

Test standard: EN 1366-2:2015 ;
Deviations: the furnace/damper pressure was slightly in excess of the prescribed limitations.
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: outside the furnace;
Supporting construction: flexible wall.

Exposure conditions during the fire resistance test (ref. No. EFR-25-U-002281-1):

Test standard: EN 1366-2:2015 ;
Deviations: the furnace/damper pressure was slightly in excess of the prescribed limitations.
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -300 Pa;
Position: outside the furnace;
Supporting construction: flexible wall.

Exposure conditions during the cold leakage test (ref. No. EFR-25-Zn-004396-1):

Test standard: §10.3 of EN 1366-2:2015;
Working pressure: -500 Pa;
Deviations: none.

Exposure conditions during the fire resistance test (ref. No. EFR-24-Zn-003373-1):

Test standard: EN 1366-2:2015 ;
Deviations: the furnace/damper pressure was slightly in excess of the prescribed limitations.
Temperature/time curve: standard as in EN 1363-1: 2020;
Working pressure: -500 Pa;
Position: outside the furnace;
Supporting construction: flexible wall.

2.2 Test results

2.2.1 Test report 18879A

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Integrity (E criterion):	91 minutes	91 minutes
Smoke leakage (S criterion):	90 minutes	83 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 91 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.2 Test report 21573A

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	45 minutes	67 minutes
Integrity (E criterion):	70 minutes	70 minutes
Smoke leakage (S criterion):	70 minutes	70 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 70 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.3 Test report 21574A

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	64 minutes	69 minutes
Integrity (E criterion):	72 minutes	72 minutes
Smoke leakage (S criterion):	72 minutes	72 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 72 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.4 Test report 21727A

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	74 minutes	82 minutes
Integrity (E criterion):	83 minutes	83 minutes
Smoke leakage (S criterion):	83 minutes	83 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 83 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.5 Test report 21738A

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	73 minutes	54 minutes
Integrity (E criterion):	74 minutes	64 minutes
Smoke leakage (S criterion):	74 minutes	63 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 74 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.6 Test report 2022-Efectis-R000658

- Test set-up: Fire test.
- Fire damper diameter: 315 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	74 minutes	67 minutes
Integrity (E criterion):	76 minutes	76 minutes
Smoke leakage (S criterion):	76 minutes	76 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 76 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.7 Test report 2022-Efectis-R000659

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	69 minutes	66 minutes
Integrity (E criterion):	71 minutes	71 minutes
Smoke leakage (S criterion):	71 minutes	71 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 71 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.8 Test report 21929A

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper
Operating pressure:	-300 Pa
Thermal insulation (I criterion):	76 minutes
Integrity (E criterion):	77 minutes
Smoke leakage (S criterion):	77 minutes
Actuating mechanism:	OK

The test was discontinued after 77 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.9 Test report 21992A

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	58 minutes	74 minutes
Integrity (E criterion):	90 minutes	90 minutes
Smoke leakage (S criterion):	90 minutes	90 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 90 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.10 Test report 21993A

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	71 minutes	85 minutes
Integrity (E criterion):	87 minutes	87 minutes
Smoke leakage (S criterion):	87 minutes	87 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 87 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.11 Test report 22157A

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	68 minutes	75 minutes
Integrity (E criterion):	75 minutes	75 minutes
Smoke leakage (S criterion):	75 minutes	75 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 75 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.12 Test report 2022-Efectis-R000660

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	93 minutes	92 minutes
Integrity (E criterion):	93 minutes	93 minutes
Smoke leakage (S criterion):	93 minutes	93 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 93 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.13 Test report 22299A

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	74 minutes	61 minutes
Integrity (E criterion):	74 minutes	74 minutes
Smoke leakage (S criterion):	74 minutes	74 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 74 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.14 Test reports 22328A

- Test set-up: Fire test.
- Fire damper diameter: 315 mm.

Parameter	Results fire damper
Operating pressure:	-300 Pa
Thermal insulation (I criterion):	78 minutes
Integrity (E criterion):	96 minutes
Smoke leakage (S criterion):	96 minutes
Actuating mechanism:	OK

The test was discontinued after 96 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.15 Test reports 22328B

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper
Operating pressure:	-300 Pa
Thermal insulation (I criterion):	91 minutes
Integrity (E criterion):	96 minutes
Smoke leakage (S criterion):	96 minutes
Actuating mechanism:	OK

The test was discontinued after 96 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.16 Test report 22/32306738

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	85 minutes	75 minutes
Integrity (E criterion):	85 minutes	85 minutes
Smoke leakage (S criterion):	85 minutes	85 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 85 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.17 Test report EFR-23-Zn-003702

- Test set-up: Fire test.
- Fire damper diameter: 800 mm x 600 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-300 Pa	-300 Pa
Thermal insulation (I criterion):	61 minutes	64 minutes
Integrity (E criterion):	64 minutes	64 minutes
Smoke leakage (S criterion):	64 minutes	64 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 64 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.18 Test report EFR-24-Zn-001622-1

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper
Operating pressure:	-300 Pa
Thermal insulation (I criterion):	122 minutes
Integrity (E criterion):	123 minutes
Smoke leakage (S criterion):	123 minutes
Actuating mechanism:	OK

The test was discontinued after 123 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.19 Test report EFR-24-Zn-001707

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper
Operating pressure:	-300 Pa
Thermal insulation (I criterion):	102 minutes
Integrity (E criterion):	122 minutes
Smoke leakage (S criterion):	122 minutes
Actuating mechanism:	OK

The test was discontinued after 122 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.20 Test report EFR-25-U-002281-1

- Test set-up: Fire test.
- Fire damper diameter: 630 mm.

Parameter	Results fire damper
Operating pressure:	-300 Pa
Thermal insulation (I criterion):	69 minutes
Integrity (E criterion):	69 minutes
Smoke leakage (S criterion):	69 minutes
Actuating mechanism:	OK

The test was discontinued after 70 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.21 Test report EFR-24-Zn-003373-1

- Test set-up: Fire test.
- Fire damper diameter: Fire damper A: 630 mm.
Fire damper B: 315 mm.

Parameter	Results fire damper A	Results fire damper B
Operating pressure:	-500 Pa	-500 Pa
Thermal insulation (I criterion):	88 minutes	99 minutes
Integrity (E criterion):	99 minutes	99 minutes
Smoke leakage (S criterion):	99 minutes	99 minutes
Actuating mechanism:	OK	OK

The test was discontinued after 99 minutes.

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.22 Test reports 22045A and 22045B

- Test set-up: Cold leakage test.
- Fire damper diameter: Test report 22045A: 400 mm.
Test report 22045B: 100 mm.
- Actuator type: Remote One L.

Parameter	Results test report 22045A	Results test report 22045B
Leakage through the fire damper at an ambient temperature at -300 Pa	Passed	Passed
Leakage through the fire damper at an ambient temperature at -500 Pa	Passed	Passed

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.23 Test report EFR-25-Zn-004396-1

- Test set-up: Cold leakage test.
- Fire damper diameter: 400 mm.

Parameter	Results
Leakage through the fire damper at an ambient temperature at -500 Pa	Passed

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.24 Test reports 22045C and 22045D

- Test set-up: Cycling test.
- Fire damper diameter: 630 mm.
- Actuator type: Test report 22045C: Belimo BFN.
Test report 22045D: Remote One L.
- Number of cycles: 10200 cycles.

Parameter	Limits	Results test report 22045C	Results test report 22045D
Average cycle time			
Total cycle time	120 seconds	Passed	Passed
Cycle time of the last cycle			
Total cycle time	120 seconds	Passed	Passed

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.25 Test report 22631A and 22631B

- Test set-up: Cycling test.
- Fire damper diameter: Test report 22631A: 315 mm.
Test report 22631B: 630 mm.
- Actuator type: Test report 22631A: Belimo BFL-SR.
Test report 22631B: Belimo BFN-SR.
- Number of cycles: 20200 cycles.

Parameter	Limits	Results test report 22631A	Results test report 22631B
Average cycle time			
Total cycle time	120 seconds	Passed	Passed
Cycle time of the last cycle			
Total cycle time	120 seconds	Passed	Passed
Cycle time during 45° to 60°			
Total cycle time		10 seconds	9 seconds

The result table is given in an abbreviated format. The full result table can be found in the test report.

2.2.26 Test report EFR-26-Zn-005928-1

- Test set-up: Cycling test.
- Fire damper diameter: Fire damper A: 315 mm.
Fire damper B: 630 mm.
- Actuator type: Fire damper A: UNIQ ME-TA L.
Fire damper B: UNIQ ME-TA L.
- Number of cycles: 10200 cycles.

Parameter	Limits	Results test report 22045C	Results test report 22045D
Average cycle time			
Total cycle time	120 seconds	Passed	Passed
Cycle time of the last cycle			
Total cycle time	120 seconds	Passed	Passed

The result table is given in an abbreviated format. The full result table can be found in the test report.

3 Classification and field of application

3.1 Reference of classification

This classification has been carried out in accordance with clause 7 of EN 13501-3:2025.

3.2 Classification

The element, type: CRS-60, is classified according to the following combinations of performance parameters and classes as appropriate. Only this and lower classifications are permitted.

The classification is valid for fire dampers (-300 Pa or -500 Pa) with the combinations given in their respected tables below.

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Pressure level: -300 Pa							
Diameter [mm]	Actuator	Supporting construction	Installation	Exposure	Duct insulation	Penetration seal	Separation distance (damper/construction)
100 mm – 315 mm or 400 mm – 630 mm	BFL*/BFN, ONE L or UNIQ ME-TA L	rigid floor, rigid wall or flexible wall	on the supporting construction	Exposed / Unexposed	N/A	5 mm acryl	≥ 10 mm / ≥ 10 mm (walls) ≥ 10 mm / ≥ 75 mm (floors)
						25 mm stuffed stone wool covered with 5mm acryl	≥ 200 mm / ≥ 75 mm
						Coated stonewool plates Promastop CC- CB + Promastop CC	≥ 200 mm / ≥ 75 mm
						Coated stonewool plates CFS-CT B (HILTI)+ CFS-CT coating (HILTI)	≥ 200 mm / ≥ 75 mm
						40 mm Gypsum	≥ 200 mm / ≥ 75 mm
						40 mm Mortar	≥ 200 mm / ≥ 75 mm
		remote from the supporting construction	Exposed / Unexposed	80 mm Rockwool 70 mm Paroc		5 mm acryl	≥ 10 mm / ≥ 10 mm (walls) ≥ 10 mm / ≥ 75 mm (floors)
						25 mm stuffed stone wool covered with 5mm acryl	≥ 200 mm / ≥ 75 mm
		flexible shaft wall (studs at the unexposed side)	on the wall	Exposed / Unexposed	N/A	5 mm acryl	≥ 200 mm / ≥ 75 mm
			remote from the wall	Exposed / Unexposed	80 mm Rockwool 70 mm Paroc	5 mm acryl	≥ 200 mm / ≥ 75 mm

*For dampers with diameter: 100 mm - 315 mm

Pressure level: -500 Pa							
Diameter [mm]	Actuator	Supporting construction	Installation	Exposure	Duct insulation	Penetration seal	Separation distance (damper/construction)
100 mm – 315 mm or 400 mm – 630 mm	UNIQ ME-TA L	rigid floor, rigid wall or flexible wall	on the supporting construction	Exposed / Unexposed	N/A	5 mm acryl	≥ 200 mm / ≥ 75 mm
						25 mm stuffed stone wool covered with 5mm acryl	≥ 200 mm / ≥ 75 mm

3.3 Field of direct application

This classification is valid for the following end use applications according to EN 1366-2:2015.

The results of the fire test are directly applicable to similar constructions where one or more of the changes listed below are made and the construction continues to comply with the appropriate design code for its stiffness and stability:

a) Size of fire damper (when smoke leakage is not required):

The classification is applicable to all dampers of the same type provided that the maximum nominal diameter does not exceed 315 mm for fire dampers CRS-60 (100 mm till 315 mm) or 630 mm for fire dampers CRS-60 (400 mm till 630 mm), and that the components remain in the same orientation as those tested.

b) Size of fire damper (when smoke leakage is required):

The classification is only applicable to the same type of damper provided that the nominal diameter is in the range 100 mm till 315 mm for fire dampers CRS-60 (100 mm till 315 mm) or 400 mm till 630 mm for fire dampers CRS-60 (400 mm till 630 mm), and that the components remain in the same orientation as those tested.

c) Fire dampers installed within structural openings:

The classification for a fire damper installed within a structural opening is only applicable to other fire dampers of the same type installed in the same orientation and position in relation to the supporting construction as that tested.

d) Fire dampers installed onto the face of a wall or floor:

The classification for a fire damper installed onto the face of a wall or floor is only applicable to fire dampers of the same type installed onto the face of a separating element in the same orientation and position in relation to the supporting construction as that tested.

e) Fire dampers installed remote from structural openings:

The classification for a fire damper installed remote from a wall or floor is only applicable to fire dampers of the same type installed with the same ductwork details as tested:

- Mounted remote from a wall and attached to a length of a horizontal fire resisting ductwork when tested remote from a wall;
- Mounted remote from a floor and attached to a length of vertical fire resisting ductwork on the side above the floor when tested above the floor;
- Mounted remote from a floor and attached to a length of vertical fire resisting ductwork on the side below the floor when tested below the floor;
- Mounted up to the same distance that was tested from the wall or floor and up to the same width and height of duct tested.

A classification obtained with the duct passing through a standard supporting construction is applicable to a supporting construction with a fire resistance equal to or greater than that of the standard supporting construction used for the test (thicker, denser, more layers of board, as appropriate).

Classifications obtained with a ducts passing through a 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.

f) Fire from above:

Fire dampers tested horizontally in floors with fire from below are acceptable in installations where fire might come from above.

g) Separation between fire dampers and between fire dampers and construction elements:

The classification is applicable to a minimum separation in practice of 200 mm between fire dampers in separate ducts and of 75 mm between a fire damper and a constructional element.

h) Supporting constructions:

The following supporting constructions are tested:

- Flexible wall constructions with type F boards;
- Flexible wall constructions with type A boards;
- Flexible shaft wall constructions with type F boards;
- Rigid floor construction with aerated concrete.

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.

i) Blade pivot axis:

Tests with the actuator mounted at the bottom of the fire damper for a test with the blades with a vertical pivot axis shall allow the damper to be installed with the actuator at the top of the unit.

3.4 Field of extended application

a) Damper housing:

The damper housing will have a minimum length of 210 mm. There's no restriction on the maximum length of the damper housing.

b) Connecting duct

The connecting duct can be any material, shape or dimension.

The ductwork connecting a remote installed fire damper to the supporting construction is considered part of the test specimen and cannot be changed.

c) Remote installation

Fire dampers can be installed remote at any distance from the supporting construction. If this distance exceeds the tested distance of 1000 mm, the number of hangers or supports will be increased in accordance with the calculations in EN 1366-1.

d) Annular gap

Stuffed stone wool seal

The gap between the fire damper and the supporting construction can be increased from 25 mm up to a maximum of 37.5 mm.

The gap between the fire damper and the supporting construction can be smaller than 25 mm, on the condition that the reduced gap size does not inhibit the installation of the seal.

Acryl seal

The gap between the fire damper and the supporting construction can be increased from 5 mm up to a maximum of 7.5 mm.

The gap between the fire damper and the supporting construction can be smaller than 5 mm, on the condition that the reduced gap size does not inhibit the installation of the seal.

Mineral wool batt

The gap between the fire damper and the supporting construction can be increased from 300 mm up to a maximum of 330 mm (measured on the quadrants of the circular damper to the square opening).

The gap between the fire damper and the supporting construction can be smaller than 300 mm (measured on the quadrants of the circular damper to the square opening), on the condition that the reduced gap size does not inhibit the installation of the seal.

Gypsum/mortar seal

The gap between the fire damper and the supporting construction can be increased from 40 mm up to a maximum of 60 mm.

The gap between the fire damper and the supporting construction can be smaller than 40 mm, on the condition that the reduced gap size does not inhibit the installation of the seal.

e) Blade pivot axis

Fire dampers applied to vertical or sloped supporting constructions can have their axis oriented in any angle.

f) Orientation of supporting construction

The fire damper can be applied to sloping supporting constructions, on the condition that the damper remains fully in the plane of the slope of the supporting construction.

g) Change in spacing between dampers

The fire dampers sealed with 5 mm acryl were tested with a minimal distance of 10 mm from each other. The classification covers dampers install from the tested distance upwards.

h) Change in spacing between dampers and constructional elements

The fire dampers sealed with 5 mm acryl in a vertical supporting construction were tested with a minimal distance of 10 mm from the damper to the surrounding supporting construction. The classification covers dampers installed in vertical supporting constructions from the tested distance upwards.

4 Limitations

This classification document does not represent type approval nor certification of the product.

SIGNED

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APPROVED

	Seppe Van Damme (Signature) Project Leader Ghent 2026.05.07 10:28:27 +02'00'
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Signed for and on behalf of Warringtonfire Gent

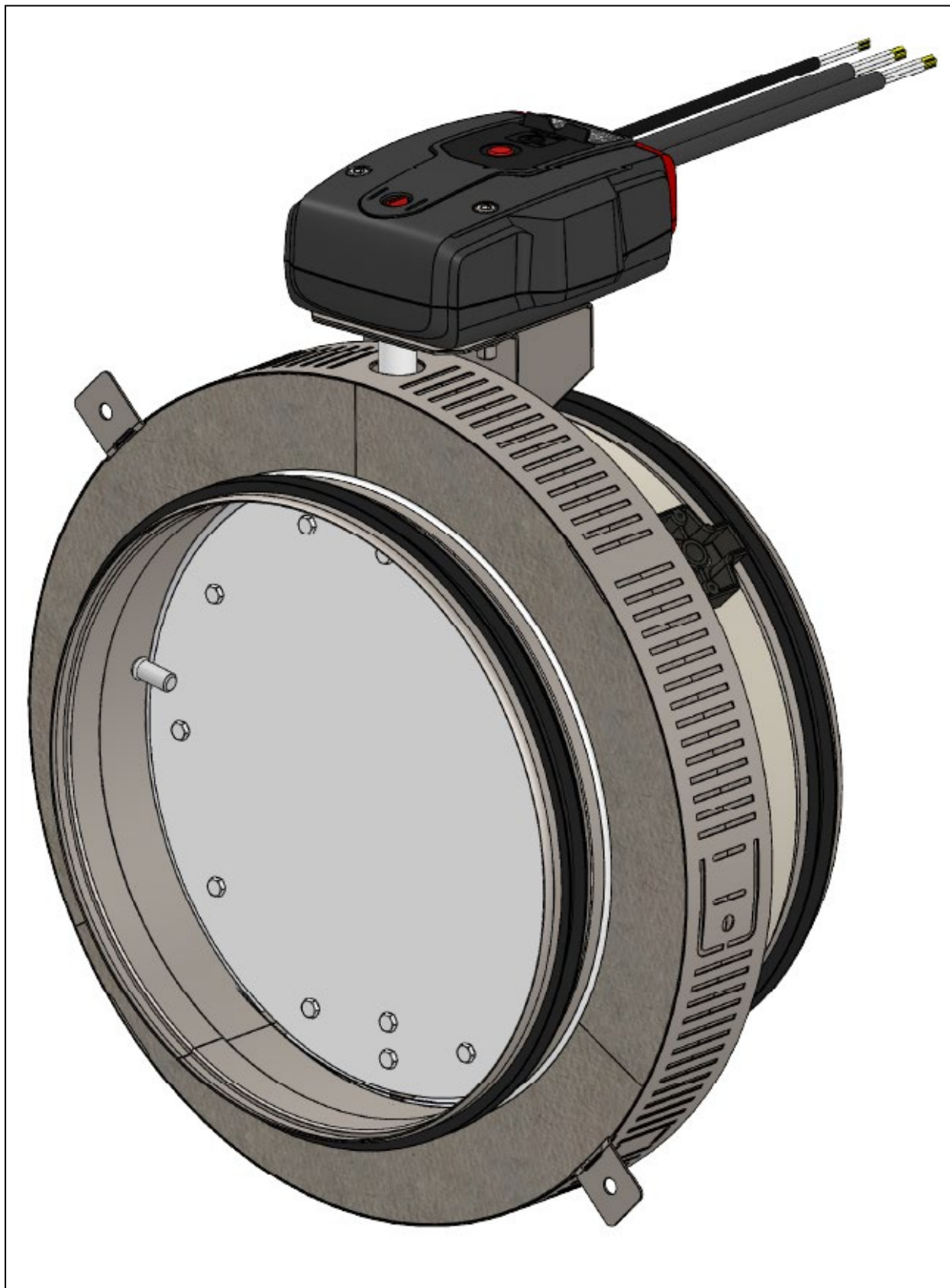
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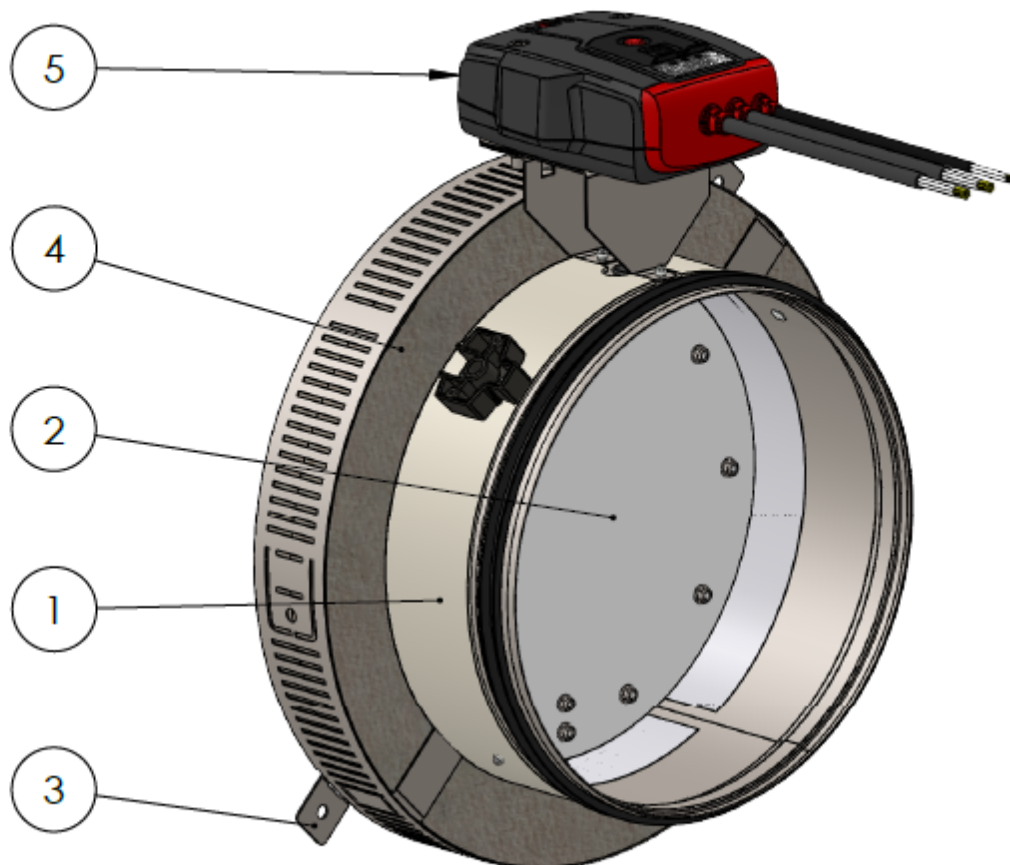
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DRAWINGS





MAIN PARTS

- 1. Damper tunnel
- 2. Damper blade
- 3. Wall limit bracket
- 4. Refractory ring
- 5. Actuator