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DMT GmbH & Co. KG

DMT Test Laboratory for Fire Protection

Test Body for Fire Protection

Tremoniastraße 13 44137 Dortmund Germany

Germany

Branch
Hermann-Kemper-Straße 12a
49762 Lathen

Telefon +49 5933 92448-0 Telefax +49 5933 92448-25 dmt-firetest@dmt-group.com www.dmt-group.com

Report for extended application according to EN 15254-4:2018 in conjunction with EN 15725:2010+AC:2012

E-6101-DMT-DO

Customer	Hansen Concepts Bredgade 4 6940 LEM ST Denmark
Compiled by	DMT GmbH & Co. KG DMT Test Laboratory for Fire Protection, Test Body for Fire Protection Hermann-Kemper-Straße 12a 49762 Lathen Germany
Number of notified body	2509
Product	Fire resisting non-loadbearing glazed partition made of aluminium profiles with glazing beads on one side
Product designation	Millenium El60
Nr. of the report for extended application	E-6101-DMT-DO
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1 Essentials

This report for the extended application concerns test results, which are reached with the test procedures according to

EN 1364-1:2015: "Fire resistance tests for non-loadbearing elements – Part 1: Walls" in conjunction with EN 1363-1:2012 "Fire resistance tests – Part 1: General Requirements" and EN 1363-2:1999 "Fire resistance tests – Part 2: Alternative and additional procedures".

The procedure to determinate the extended application is done in accordance with the following standard about the extended application

EN 15254-4:2018: "Extended application of results from fire resistance tests – Non-loadbearing walls – Part 4: Glazed constructions".

The report is done in accordance with the standard procedure as given in EN 15725:2010 + AC:2012 "Extended application reports on the fire performance of construction products and building elements".

Furthermore the standard EN 13501-2:2016 "Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services" serves as basis for the classifications.

2 Description of the tested construction

2.1 Type

2.1.1 Technical specification of the product

The product "Millenium El60" is specified as an aluminium frame system with glass panes.

2.1.2 Product family

The product family is described as followed by the manufacturer:

It is a non-loadbearing partition made of aluminium profiles filled with glass panes with fire resistance for closing an opening in a fire resistant component in buildings and construction works to provide fire resistance.

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2.1.3 Intended use

The product "Millenium EI60" is intended to be used as non-loadbearing glazed wall. It shall fulfil the characteristic specifications for fire resistance behaviour according to section 5 of EN 13501-2. For one-sided fire load of the face of the glazing beads or the opposite side the product shall prevent the leakage of flames or hot gases towards the unexposed side and thereby fulfil the criterion of integrity E (section 5.2.2). Furthermore, the transmission of radiation energy W (section 5.2.4) towards the unexposed side shall be limited. This is given in this case with the performance of the criterion of the insulation I (section 5.2.3), which describes the ability of the product to resist the significant transmission of thermal energy towards the opposite side when flamed from one side. The average temperature increase is limited to 140 K and the maximum temperature increase to 180 K.

A load side is not determined, the load may occur both from glazing beads' side as also the profile side.

2.1.4 Final application conditions

The product "Millenium El60" is used as a non-loadbearing glazed partition with fire resistance for closing an opening in a fire resistant component in buildings and construction.

2.2 Product description

The product "Millenium El60" is a non-loadbearing glazed wall with aluminium frame profiles with glazing beads on one side and fire resistant glass panes.

The test specimen is fully described in the test reports as also the drawings, so here a detailed description is spared.

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3 Test reports and test results as basis of this extended application

Basis for the extended application regarding the fire resistance were the following documents.

All test reports listed below are issued on Hansen Concepts as client.

3.1 Basis of extended application for fire protection

All performed fire tests were done according to EN 1634-1:2015 in conjunction with EN 1363-1: 2012.

Table 1: Test reports according to EN 1634-1 – fire resistance

No.	Test laboratory / test report number	Test date	Test report date			Max. glass pane dimensions (W x H) [mm]	Exposed side	Supporting construction	Result [min]
F1	DMT GmbH & Co. KG DMT-DO-61-134-R1	22.01.2019	08.08.2019	2509	2980 x 3000	1460 x 2964	Glazing beads / fire protection glass pane	Test frame	E = 70 I = 70
F2	DMT GmbH & Co. KG DMT-DO-61-135-R1	23.01.2019	08.08.2019	2509	2980 x 3000	1460 x 2964	Profile / insulation glass pane	Test frame	E = 70 I = 69

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3.2 Conditions of the fire resistance tests

The heating of the furnace was done according to the temperature/time curve as given in EN 1363-1:2012. No load was applied and no impact test was conducted.

For F1 the glazing beads were exposed to the fire. For F2 the profile side was flamed. Both test specimen were fastened at three sides. The lateral side of the largest glass panes was not fixed.

3.3 Detailed test results

Parameter	Results F1	Results F2
Integrity – cotton pad	70 minutes	70 minutes
Integrity - sustained flaming	70 minutes	70 minutes
Integrity – gap gauge	70 minutes	70 minutes
Thermal insulation – mean temperature	70 minutes	70 minutes
Thermal insulation – maximum temperature	70 minutes	69 minutes
Radiation	70 minutes	70 minutes
Test duration	70 minutes	70 minutes

3.4 Sampling

The sponsor provided a description of all constructional details and drawings prior to the test. The test body has examined the accordance of the test specimen with the presented information during the construction as also before and after the test. The conformity of the test specimen with the provided information was verified. Due to that the requirement of EN 1363-1, paragraph 6.5 was fulfilled.

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3.5 Deviations from the test standard

No tests deviating from the test standard were performed.

3.6 Pre-existing test data

No pre-existing test data is used, all tests were conducted in accordance with EN 1364-1:2015 and EN 1363-1:2012.

4 Basis for the application

4.1 Classification of the product

The product to assess "Millenium El60" shall receive the classifications

E 60

EI 60

EW 60

4.2 Reference tests

The following tests are determined as basis for the evaluation of the extended application.

F1, F2

The reference tests were performed from the profile side (F2) and the glazing bead side (F1). The selection of the exposed side of the additional tests was made according to the requirements of EN 1364-1.

4.3 Annotations regarding the direct application

The direct application is shown in the test standard and the respective section of the applied test reports. For both tests F1 and F2 overrun time B was reached.

If the direct application is consulted for the evaluation of the extended application, it is stated with the particular chapter number and the lines are indented. The parts of direct application which are not referred to particularly in EN 15254-4 are given in 5.6.

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5 Extended application according to EN 15254-4

5.1 For the extension of application used principles

This procedure for extended application bases on procedure 1 and procedure 4.

5.2 Annotations

In 5.3 the parameters, factors and rules according to Table 1 of EN 15254-4:2018 are shown with the corresponding paragraphs of EN 15254-4 and the corresponding sections of this documents resp. the annotation "not applied" for those rules, which were not applied to the construction and will not be find in the following text. First the applicable text of the standard is given which is followed by the results resulting of the conducted fire tests.

5.3 Parameters, Factors and Rules for glazing and framing systems and glazed elements

Parameter	Factor	Rule see clauses of EN 15254-4	Results of EXAP shown in section of this EXAP report
Glazing system			
Change of glass type and thickness	Replacement of glass within the same glass product range	5.1	5.4.1
Glass shapes	Rules to glass shapes	5.2	Not applied
Glass dimensions	Increase in glass dimensions	5.3	5.4.2
Timber beads	Exchange of timber species / bead fixing / bead shape and dimensions	5.4	Not applied
Metal beads	Exchange of bead fixing / bead shape and dimensions	5.5	Not applied
Exchange of glazing materials	Gaskets/glazing strips / setting blocks	5.6	5.4.3
Bead surface coverings	Changes or adding surface coverings	5.7	Not applied

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Framing system			
Exchange of frames (general)	Type of material / junction types / edge cover	6.1.1	5.5.1
Timber frames	Thickness / profile / timber type (charring rate / density)	6.1.2	Not applied
Metal frames	Frame materials / sections / thickness of chamber walls	6.1.3	5.5.2
Frame surface covering	Changes or adding frame surface coverings	6.2	Not applied
Fire resistant glazed ele- ment			
Glazed element classified EW	Increase in dimensions and replica- tion for fire resistant glazed ele- ments	7.1	Not applied
Glazed element classified EW	Decrease in dimensions for fire resistant glazed elements	7.2	Not applied

5.4 Glazing system

5.4.1 Exchange of fire resistant glass

For classification E, EW and EI the following rules apply:

- The overall glass thickness may be increased provided that no fire protection interlayer and no individual glass component will be decreased.
- The thickness of individual non-fire protection components (e.g. polyvinyl butyral PVB, ethyl vinyl acetate EVA, polyurethane PU, polycarbonate PC) shall not be increased. It may be decreased which results in a decrease of the overall glass thickness.
- For IGUs, the width of each cavity may be reduced.

For the construction two types of fire resistant glass according to EN 15254-4, paragraph 5.1.1 shall be considered:

Type B: insulating glass unit (IGU) consisting of the component that provides the fire resistance, a monolithic counter pane with or without additional coatings on either side of the counter pane and an optional middle pane with or without coatings

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Type C: insulating glass unit (IGU) consisting of the component that provides the fire resistance, a laminated counter pane with or without additional coatings on either side of the counter pane and an optional middle pane with or without coatings

In F1 Type B is tested with the component that provides the fire resistance on the exposed side with one cavity (rules EN 15254-4, paragraph 5.1.2), for F2 type C was tested with the component that provides the fire resistance tested on the unexposed face with two cavities (rules EN 15254-4, paragraph 5.1.2).

In For the conducted test of Type B the following exchanges allowed without additional test evidence are stated:

- Test results of type B are equally applicable to type C and vice versa.
- Test results of type B without additional coatings are equally applicable to type B with additional coatings but not vice versa.
- Test results of type B without additional coatings are equally applicable to type C with additional coatings but not vice versa.
- Test results of IGUs obtained with one cavity are equally applicable for IGUs with 2 cavities. The total width of both cavities may not be increased by more than a factor of 2 based on the tested cavity width.
- Additional non-fire resistant glass panes may be added to the tested glass using non-fire protection interlayers with a thickness < 1mm.

For the conducted test of Type C the following exchanges allowed without additional test evidence are stated:

- Test results of type C are equally applicable to type B but not vice versa.
- Test results of type C without additional coatings are equally applicable to type C with additional coatings and vice versa.
- Test results of type C without additional coatings are equally applicable to type B with additional coatings but not vice versa.
- Test results of IGUs obtained with two cavities are equally applicable for IGUs with 1 cavity provided the cavity width is not increased from the total width of both cavities tested.

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- Additional non-fire resistant glass panes may be added to the tested glass using non-fire protection interlayers with a thickness < 1 mm.
 - Results: The tested glass panes were of type "Contraflam 6-3 IGU" and consisted of the following layers.
 - Type B: Toughened glass / thickness 6 mm, without coating / aluminium spacer, thickness 20 mm / CONTRAFLAM 60-3 (toughened glass, thickness 5 mm / interlayer, thickness 3 mm / heat-strengthened glass, thickness 4 mm / interlayer, thickness 3 mm / heat-strengthened glass, thickness 4 mm / interlayer, thickness 3 mm / toughened glass, thickness 5 mm).
 - Type C: CONTRAFLAM 60-3 / aluminium spacer, thickness 6 mm / toughened glass, thickness 6 mm, without coating / aluminium spacer, thickness 6 mm / laminated glass STADIP PROTECT SP510 without coating / annealed glass, thickness 4 mm / PVB film 2,28 mm (6 x 0.38 mm) / annealed glass 4 mm.
 - For both tests the glass pane sizes were the same.
 - The tested glass panes may be used each for fire expected on the side of the component that provides fire resistance as also on the opposite side.
 - It is possible to place the component that provides fire resistance (CONTRAFLAM 60-3) on both sides.
 - Other insulating glass units with basis "CONTRAFLAM 60-3" and counter panes of monolithic or laminated type as tested are possible.
 - An increase in overall thickness is possible.
 - The fire protection interlayers may not be decreased.
 - The individual glass component will not be decreased.
 - The thickness of the PVB layer may be decreased but not increased.
 - The counter panes of monolithic or laminated type can be coated.
 - The insulating glass units may be constructed with one or two cavities. The maximum cavity width is 12 mm, resulting of F2. If the component that provides fire resistance is on the fire side, the maximum value for the cavity width is 20 mm, resulting of F1. The cavity width may be reduced.
 - Additional non-fire resistant glass panes may be added to the tested glass using non-fire protection interlayers with a thickness < 1mm.

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5.4.2 Increase of glass dimensions

For individual glass panes where the E or El classification is relevant, no extension to those defined by the field of direct application is allowed.

For both tests F1 and F2 overrun time B was reached. The field of direct application states the following:

The linear dimensions of panes may be decreased from the dimensions tested. Height and width may be considered independently.

The test result of a pane covers dimensions up to a maximum of the tested dimensions multiplied by a factor of 1.1 in width and/or height, provided overrun time A is achieved and the maximum tested area multiplied by a factor 1.1 is not exceeded.

The test result of a pane covers dimensions up to a maximum of the tested dimensions multiplied by a factor of 1.2 in width and/or height, provided overrun time B is achieved and the maximum tested area multiplied by a factor 1.21 is not exceeded.

In order to accommodate the increase in glass dimension, it is permitted to increase the distance between mullions and/or transoms.

As only panes in portrait format tested, the calculation of permitted aspect ratio is not conducted.

Result: The maximum tested glass panes had a size of 1460 mm x 2964 mm for both F1 and F2. The maximum glass pane sizes for the classes E, EI and EW are a width of 1752 mm and a height of 3557 mm with a maximum area of 5,24 m².

5.4.3 Exchange of metal glazing beads

It is not allowed to exchange the type of material used for the glazing beads.

Changes in bead shape is not allowed.

Bead width maybe increased.

Reductions in bead width are not allowed. The bead depth may be increased provided that the mechanical edge cover does not change.

The field of direct application also states the following regarding glazing beads:

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Test results on "clip-on" beads cover screwed-on beads, applied with the same or smaller centre to centre distance.

■ Result: The glazing beads made of aluminium cannot be changed in material and shape and cannot be decreased in dimensions. The tested and so minimum dimensions were height 15,5 mm, depth 18 mm.

5.5 Framing system

5.5.1 Exchange of frames - general

It is not allowed to exchange the type of material used to construct the frame.

Frames may be manufactured using some or all of the following junction types:

Type A: four panes coming together at one point

Type B: three panes coming together at one point, including a full height vertical pane

Type C: three panes coming together at one point, including a full width horizontal pane

Type D: two panes, side by side, all panes in full size vertical (mullion) or horizontal (transom)

Type E: corner junction

as shown in Figure 6 of EN 15254-4:2018.

Result: The frame has to be made of aluminium. The allowed junctions are Types A,
 B, C and E. D was not tested.

5.5.2 Exchange of frames - metal frames

In addition to the general rules, the following additional rules apply for steel and aluminium frames.

Exchange of aluminium for aluminium frames is allowed provided that:

- Frame section may be changed provided that it is be demonstrated that:
- 1) the inertia of the profiles is not reduced in the cold state
- 2) frame section width is not reduced
- 3) wall thickness and number of chambers in the frame are not reduced.

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■ Result: The possible frame sections are shown in annex 1.3 of this report. The tested frame was the one with the minimum width. The wall thickness and the number of chambers are not reduced for the other shown frames.

5.6 Field of direct application according to EN 1364-1:2015 paragraph A.4

5.6.1 Installation angle

Test results on vertical glazed elements cover glazed elements sloped to a maximum angle of ± 10° from the vertical plane, provided the height of the glazed element is not larger than the maximum height tested.

5.6.2 Dimensions of the glazed element

5.6.2.1 Height

Test results cover rectangular elements with a height increase of 10 % subject to a maximum increase of 0.3 m, above the height tested, provided that:

- a) the maximum deflection of the test specimen did not exceed 100 mm;
- b) the allowances for thermal expansion of the construction are increased pro-rata.

For elements with overrun time A or B the following rules apply:

The test result of the glazed element covers the height up to a maximum of the tested height multiplied by a factor of 1.1, provided overrun time A is achieved. This is irrespective of the measured deflections.

The test result of the glazed element covers the height up to a maximum of the tested height multiplied by a factor of 1.2, provided overrun time B is achieved. This is irrespective of the measured deflections.

Result: The maximum element height for the classes E, El and EW is 3600 mm.

5.6.2.2 Width

The results cover rectangular glazed elements of greater width by replication of the tested glazed element or parts thereof, provided:

a) the framing system is identical to the one tested;

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- b) the width of the specimen in the test was 2.8 m or greater with one vertical edge unrestrained;
- c) the mullions within and/or connection joints between glazed elements have been tested.

For elements with overrun time A or B the following rules apply:

The replication of the glazed element is covered based on the rules described above.

Result: The maximum element width for the classes E, El and EW is unlimited by replication of the element or parts thereof.

5.6.3 Framing system

The distance between mullions and/or transoms may be decreased from that tested.

The distance between fixing centres may be decreased from that tested.

The cross sectional dimensions of the frame profiles may be increased from the dimensions tested, under the following restriction:

- For combustible framing intended to be used for E and/or EW classification, the depth of the frame profiles on the unexposed side is as tested,
- For framing systems intended to be used for EI classification, no increase in width is allowed in case no temperature measurements on the unexposed side of the profiles were made during the test.
- Results: The maximum tested distance between mullions and/or transoms may be increased due to the increase of glass panes given in 5.4.2. The maximum fixing distance is 750 mm. The profile width may be increased as temperature measurements on the unexposed frame were made. The minimum frame width is given in 5.5.2.

5.6.4 Supporting construction

For specimens tested in the test frame without any supporting construction, the result is applicable to high density rigid supporting constructions with at least the same fire resistance as the test specimen.

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The permitted rigid supporting constructions can be interfaced with all edge-types of the glazed element.

6 Results of the extended application

For the product "Millenium El60" to evaluate the extended application given in section 5 regarding the classification

E 60

EI 60

EW 60

is determined.

The scope of the direct and extended application of the evaluated component "Millenium El60" regarding the classification E 60 resp. El 60 resp. EW 60 is described in this report for direct application and the annexes of this report.

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7 General Statement

The extended application results relate to the behaviour of a product/product family under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product/product family in use.

This extended application is issued on the basis of test data and the content of EN 15254-4 at the time of issue.

The extended application report does not substitute the classification report according to EN 13501-2.

Kanjahn

(case worker)

Lathen, 08.08.2019

(deputy head of test lab)

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Annotations

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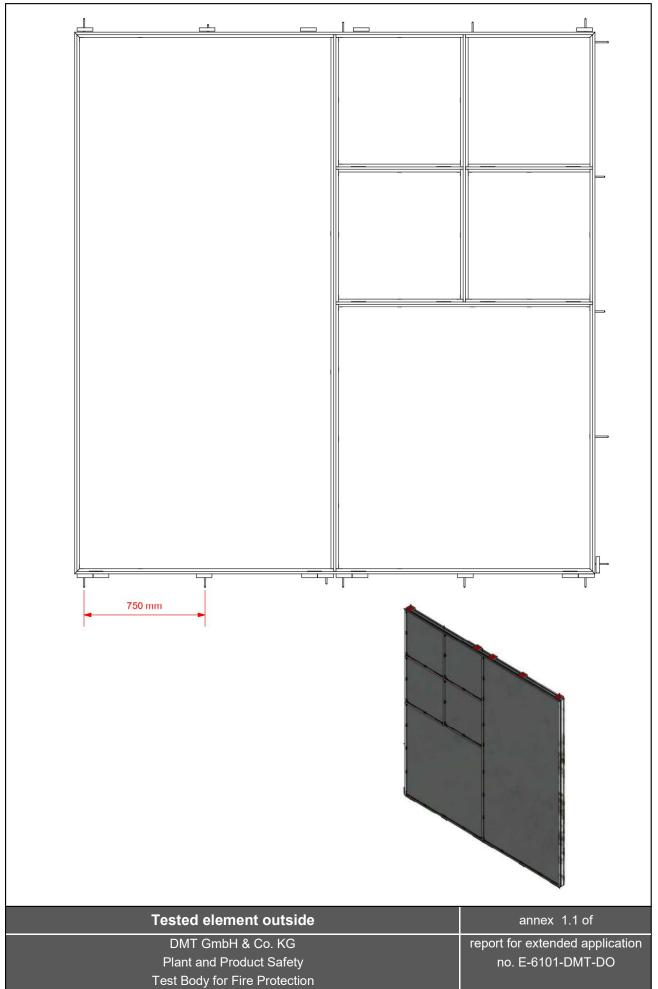
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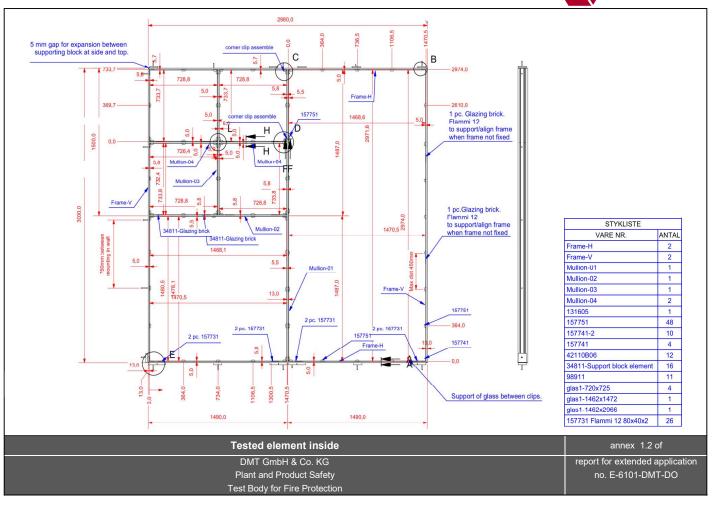
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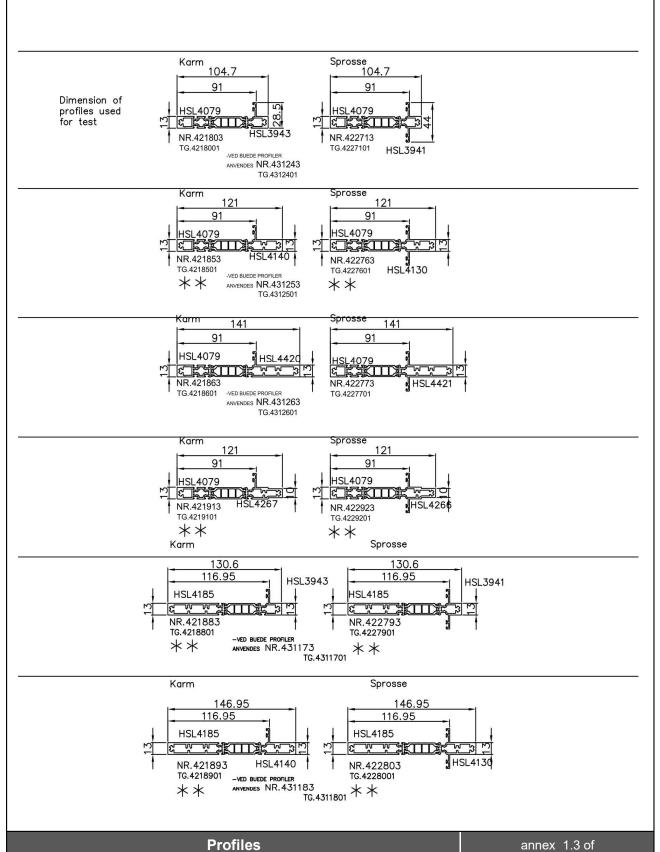








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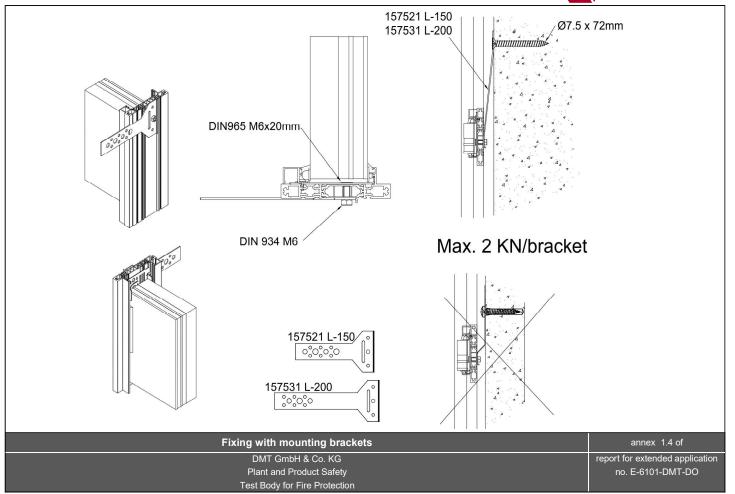
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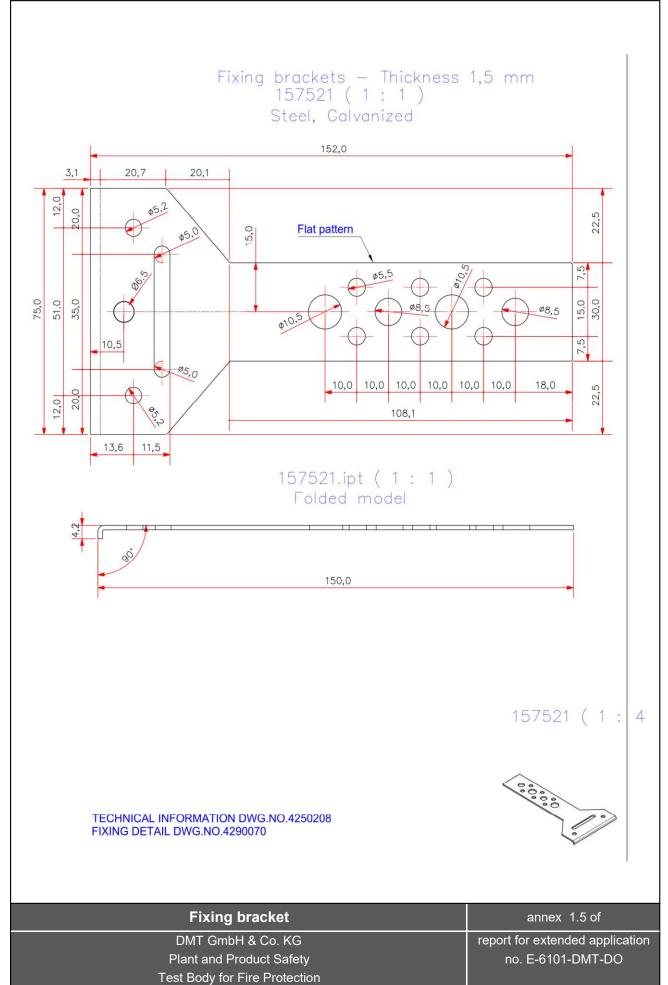
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DMT Test Laboratory for Fire Protection

Test Body for Fire Protection

Tremoniastraße 13 44137 Dortmund

Germany Branch

Hermann-Kemper-Straße 12a 49762 Lathen Germany
Telefon +49 5933 92448-0

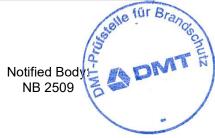
Telefon +49 5933 92448-0
Telefax +49 5933 92448-25
dmt-firetest@dmt-group.com
www.dmt-group.com

Classification of Fire Resistance Performance in accordance with EN 13501-2:2016

K-6014-DMT-DO

Customer	Hansen Concepts Bredgade 4 6940 LEM ST Denmark
Compiled by	DMT GmbH & Co. KG DMT Test Laboratory for Fire Protection, Test Body for Fire Protection Hermann-Kemper-Straße 12a 49762 Lathen Germany
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ANNEXES 1.1 AND 1.2 OF CLASSIFICATION REPORT

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1 Introduction

This classification report of fire resistance performance defines the classification assigned to a fire protection glazing wall with designation "Millenium El60" in accordance with the procedures given in EN 13501-2:2016.

2 <u>Details of classified product</u>

2.1 General

The building component "Millenium EI60" in combination with fire protection glass panes "Contraflam 60-3 IGU" is defined as a non-loadbearing internal partition assembly.

The building component "Millenium EI60" is provided for the appropriation as a fire protection non-loadbearing partition. It fulfils specific performance characteristics for fire resistance behaviour according to section 5 of EN 13501-2 when flamed one-sided (section 5.2.2, 5.2.3 and 5.2.4).

An exposed side is not defined.

2.2 Detailed product description

Frame: product: Millenium El60

manufacturer: Hansen Concepts

Panes: product: Contraflam 60-3 IGU

manufacturer: Vetrotech Saint-Gobain International AG

The product "Millenium El60" is a non-loadbearing fire protection glazed partition consisting of an aluminium frame and fire protection glass panes of type "Contraflam 60-3 IGU". The building component is described completely in the test reports and the report of extended application, which are referred to in section 3.1 and 3.2 for verification of classification, as also roughly in the annexes of this classification report.

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3 <u>Test reports / reports of extended classification and test results for verification of classification</u>

3.1 Test reports

3.1.1 Test reports according to EN 1364-1

No.	Name of Laboratory No. of Notified Body	Name of spon-	Test report no.	Test method
F1	DMT GmbH & Co KG 2509	Hansen Concepts	08.08.2019	EN 1364-1: 2015 EN 1363-1: 2012
F2	DMT GmbH & Co KG 2509	Hansen Concepts	08.08.2019	EN 1364-1: 2015 EN 1363-1: 2012

3.1.2 Test results of test reports according to EN 1364-1

Test report number Brief description of the test specimen	Parameter	results[min]
(F1) DMT-DO-61-134-R1	Integrity (cotton pad)	70
Non-loadbearing assembly made of aluminium pro-	Integrity (gap gauge)	70
files and six pieces of fire protection glass panes "Contraflam 60-3 IGU" with an element size of	Integrity (sustained flaming)	70
2980 mm x 3000 mm and a maximum glass pane size of 1460 mm X 2964 mm. Exposed side glazing beads side	Insulation I	70
	Radiation	70
(F2) DMT-DO-61-135-R1	Integrity (cotton pad)	70
Non-loadbearing assembly made of aluminium pro- files and six pieces of fire protection glass panes	Integrity (gap gauge)	70
"Contraflam 60-3 IGU" with an element size of	Integrity (sustained flaming)	70
2980 mm x 3000 mm and a maximum glass pane	Insulation I	69
size of 1460 mm X 2964 mm. Exposed profile side	Radiation	70

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3.2 Reports of extended application

Nr.	Report no. dated	Name of Test Body Notified Body	Name of sponsor	Standard of extended application
E1	E-6101-DMT-DO 08.08.2019	DMT GmbH & Co. KG 2509	Hansen Concepts	EN 15254-4:2018

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4 Classification and field of application

4.1 Reference of classification

This classification was carried out in accordance with EN 13501-2:2016, section 7.5.2.

4.2 Classification

The fire protection door of type "Millenium El60" of Hansen Concepts with glass panes "Contraflam 60-3 IGU", may be classified according to the following combinations of performance parameters and classes as appropriate.

R	E	1	W	t	t	-	M	S	С	IncSlow	sn	ef	r	

Fire resistance classification: E 60, El 60, EW 60

4.3 Field of application

The scope of the classified component with direct and extended field of application is given in the test reports and the report of extended application.

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(case worker)

5 **Limitations**

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

Lathen, 08.08.2019

(deputy head of test lab)

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Annotations

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