

CLASSIFICATION OF FIRE RESISTANCE ACCORDING TO EN 13501-2: 2016 OF A METACON OHD ECO SECTIONAL DOOR-SET

Classification no.	2017-Efectis-R001495[Rev.3]
Sponsor	Metacon Branddeuren James Wattstraat 14 2809 PA GOUDA Nederland
Product name	METACON OHD ECO EI(1)60
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1. INTRODUCTION

This classification report defines the resistance to fire assigned to a sectional door type Metacon OHD EI(1)-60 mounted on a wall, in accordance with the procedures given in EN 13501-2: 2016.

2. REVISION INFORMATION

The reference to the version number of the test report has been amended.

3. DETAILS OF CLASSIFIED PRODUCT

3.1 GENERAL

A fire test was carried out on a sectional door-set type Metacon OHD EI(1)-60 mounted on a low density rigid supporting construction being an aerated concrete wall at the direct exposed side.

For the dimensions and specifications of the materials and components of the examined construction also see the figures in chapter 8. Significant details of the construction are given in the paragraphs below.

3.2 SUPPORTING CONSTRUCTION

The test specimen was built in a standard low density rigid supporting construction according to EN 1363-1:2012 being an aerated concrete wall thickness 150 mm and a density of $650 \pm 200 \text{ kg/m}^3$. The dimensions of the wall aperture: 4450 x 3600 mm (w x h).

3.3 SECTIONAL DOOR-SET

The door-set comprised aluminium covered / magnesium oxide board wooden frame door sections. On all sides of the frame except de bottom edge Permoxx board was applied and mounted with shooting nails. The board was nailed to the wooden frame and the aluminium covers were glued to the board. The sections were insulated with mineral wool. Each shutter section was attached to another section with four steel hinges.

Overall dimensions of the door-set	
Height	3897 mm
Width	4770 mm
Thickness	81.6 mm
Specifications of the door sections	
Height:	550 mm
Wooden frame	Glued (see fig. 6 and 7)
Dimensions of the pinewood frame members	65 mm x 40 mm x (w x h)
Cover of frame	Permoxx (magnesium oxide board)
Thickness	6 mm
Position	All sides of section except bottom

Shooting nails dimensions	Ø 2.1 x 35 mm
C.t.c distance	± 500 mm
Aluminium cover	Aluminium stucco sheet
Thickness	0.63 mm
Location	At both faces of the section
Glue	Ankerweld 2514 R
Material insulation	Mineral wool
Manufacturer	Rockwool
Type	236
Thickness	60 mm
Specifications steel hinges	
Manufacturer	ConDoor
Material	Zinc electroplated steel
Dimensions	60 mm x 155 mm x 2 mm (w x h x t)
Locations at guiding system	A pair at each edge
Locations at top of the section	Four with c.t.c. distance 700 mm

3.4 PLASTER BOARD LINING SUPPORTING CONSTRUCTION

On the supporting construction following the edges of the aperture a strip of fire resistant plaster board, dimensions 160 mm x 15 mm (w x t), was fixed with phosphated plasterboard screws, Ø 3.5 mm x 55 mm, the edge of the strip against the guiding system. The pair of intumescent strips were stuck to the plasterboard, one aligning the edge of the plasterboard strip. (See FIGURES: detail 4)

3.5 SIDE GUIDES

The ConDoor side guide mounting bracket was made of zinc electroplated steel with a thickness of 2 mm and guided the two inch steel wheels on a 11 mm steel shaft. The wheels had a Nylon finish. The wheels were connected to the ConDoor steel hinges described in 2.3. (See FIGURES: detail 1)

3.6 FLAME BARRIER

On the lintel of the supporting construction and on the top door section flanges, width 50 mm, of zinc electroplated steel, thickness 2.0 mm, were mounted that formed a labyrinth flame barrier. (See FIGURES: detail 2)

3.7 INTUMESCENT STRIPS

Between the shutter sections a 20 x 2 mm Palusol fire seal was applied. Two strips of Palusol 45 x 4 mm were applied between the door and the wall on the vertical sides. Two strips of

Palusol 45 x 4 mm were applied between the door-set and the wall at the top horizontal side.
(See FIGURES: detail 4)

3.8 FIXINGS

The side guides were fixed with M8 threaded rods, c.t.c. distance 1000 mm, through the wall.

3.9 METHOD OF ASSEMBLY

The shutter was built in the following order:

- Assembly of the aerated concrete wall
- Mounting of the side guides
- Mounting of the sections
- Connecting the sections.

4. SAMPLING AND MANUFACTURING OF THE CONSTRUCTION

Efectis Nederland BV Centre for Fire Safety	Test frame Supporting construction
Metacon BV	Producing sectional door-set Assembly of construction

5. TEST REPORT & TEST RESULTS IN SUPPORT OF CLASSIFICATION

5.1 TEST REPORT

Name of laboratory	Name of sponsor	Test report no.	Test method
Efectis Nederland BV THE NETHERLANDS	Metacon Branddeuren Nederland	2017-Efectis- R001493[Rev.1]	EN 1634-1:2014

5.2 TEST RESULTS

Criterion	Time (min.)	Result
Integrity (E) <ul style="list-style-type: none"> ▪ Cotton pad ▪ Gap Gauge: <ul style="list-style-type: none"> Ø 6 mm Ø 25 mm ▪ Sustained flaming > 10 seconds 	72	No failure Not determined Not determined No failure
Insulation (I) <ul style="list-style-type: none"> ▪ Average temperature ▪ Maximum temperature 	72 72	No failure No failure
Heat radiation (W)	72	No failure, max. 0.7 kW/m ² at 72 min.
The heating was terminated after 72 minutes in concurrence with the client.		

6. CLASSIFICATION

6.1 REFERENCE OF CLASSIFICATION

This classification has been prepared in accordance with clause 7 of EN13501-2:2016.

6.2 CLASSIFICATION

The sectional door type Metacon OHD EI(1)-60 is classified according to the criteria and classes:

E60
I₁60 and I₂60
EW60

7. FIELD OF APPLICATION

Any significant deviation with respect to size, constructional details, load stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method was not covered by this report.

7.1 GENERAL

The field of direct application defines the allowable changes to the test specimen following a successful fire resistance test. These variations can be applied automatically without the need for the sponsor to seek additional evaluation, calculation or approval.

NOTE When extended product size requirements are envisaged, the dimensions of certain components within the test specimen can be less than those intended to be used at full size in order to maximize the extrapolation of the test results by modelling the interaction between components at the same scale.

Where referred to annex B or annex C in this paragraph, the annexes in EN 1634-1:2014 are meant.

7.2 MATERIALS AND CONSTRUCTION

7.2.1 General

Unless otherwise stated in the following text, the materials and construction of the door-set or openable window shall be the same as that tested. The number of leaves and the mode of operation (e.g. sliding, single action or double action) shall not be changed.

7.2.2 Specific restrictions on materials and construction

7.2.2.1 Metal construction

The dimensions of metal wrap around frames may be increased to accommodate increased supporting construction thickness. The thickness of the metal may also be increased by up to 25%.

The type of metal shall not be changed from that tested.

The number of stiffening elements for uninsulated doors and the number and type of fixings of such members within the panel fabrication may be increased proportionally with the increase in size but shall not be reduced.

7.2.3 Decorative finishes

7.2.3.1 Paint

Where the paint finish is not expected to contribute to the fire resistance of the door, alternative paints are acceptable and may be added to door leaves or frames for which unfinished test specimens were tested. Where the paint finish contributes to the fire resistance of the door (e.g. intumescent paints) then no change shall be permitted.

7.2.4 Fixings

The number of fixings per unit length used to attach door-sets to supporting constructions may be increased, but shall not be decreased and the distance between fixings may be reduced but shall not be increased.

7.2.5 Building hardware

The number of hinges and dog bolts may be increased but shall not be decreased.

NOTE 1 The number of movement restrictors such as locks and latches is not covered by direct application.

Where a door-set has been tested with a door closing device fitted, but with the retention force released in accordance with 10.1.4 of EN 1634-1, the door-set may be provided either with or without that closing device, i.e. where self-closing characteristics are not required.

NOTE 2 Interchange of building hardware is not covered by the field of direct application.

7.3 PERMISSIBLE SIZE VARIATIONS

7.3.1 General

Door-sets of sizes different from those of tested specimens are permitted within certain limitations, but the variations are dependent on product type and the length of time that the performance criteria are fulfilled.

The increase and decrease of dimensions permitted by the field of direct application are applicable to the overall size and to each door leaf, each side panel and each over panel independently.

In accordance with 13.2.2.3 in EN 1634-1, the dimensions (width and height) of any glass pane cannot be increased.

7.3.2 Test periods

The amount of variation of size permitted is dependent on whether the classification time was just reached (Category 'A') or whether an extended time (Category 'B') in accordance with the values shown in Table 1 were fulfilled before the test was concluded.

For category 'B':

Table 1 — Category B overrun requirements

Classification time (min)	All performance criteria fulfilled for at least minutes
15	18
20	24
30	36
45	52
60	68

7.3.3 Size variation related to product type

7.3.3.1 General

The rules to cover increase or decrease of size without additional considerations are applicable only to six main product groups:

- a) horizontally sliding and vertically sliding door-sets including sectional door-sets;

No increases in size are permitted for door-sets which are required to satisfy radiation control levels unless the insulation criteria are also satisfied. This is because any increase in size will increase the radiation received at a fixed distance away from the door. There are calculation methods which can be used to determine acceptable size increases for such doors; however, these are beyond the scope of direct application. Doors that satisfy both the radiation control levels and insulation criteria may have their sizes increased as outlined in Annex B of EN 1634-1. This is accepted because the increase in radiation resulting from a size increase allowed under this section, for an insulated door, will be such that it will still satisfy the required radiation control levels. Size decreases are permitted for both doors which satisfy radiation control levels and those which satisfy insulation criteria and radiation control levels.

Permissible variations for each product group are detailed in Annex B of EN 1634-1 which also contains some examples relating to hinged/pivoted door-sets.

Size increases for door-sets which do not fall into one of the six groups given above are the subject of extended application.

7.3.3.2 Horizontally sliding and vertically sliding door-sets including sectional doors

For size variations, see Annex B.

For Category 'A' tests (with no overrun of classification period) unlimited size reduction is permitted with the exception of insulated metal door-sets where the size reduction is limited.

For Category 'B' tests (with specified overrun of classification period) all smaller sizes are permitted and increases in height and width are permitted as stated below:

Category 'B' overrun is applicable for **EI₁60 and EI₂60**.

Limits of permitted size increase ANNEX B			
Width (mm)	4770	Increase width 50%	7155
Height (mm)	3897	Increase height 50%	5846
Total surface (m ²)	18.6	Increase surface 50%	27.9

For test specimen with door leaves manufactured to the maximum size allowable in a standard 3,0 m by 3,0 m furnace, the height and/or the width can be increased provided that the area is not increased by more than 50%. Additionally, test specimens comprising joined panels shall incorporate at least one full size panel with at least one example of each jointing technique for height and width as applicable.

Both of the above extensions to width and height are only permissible if the overlaps at the rear and head of the door are adjusted to increase the tightness of the interlock (shown in Figure 33) by 10 mm per metre of increase in size.

The maximum gap at the bottom of the door may be decreased from the maximum tested but shall not be increased above the maximum tested.

For operable fabric curtains the material thickness of side guides and barrel carrying end plates may be increased up to 50% but it shall not be reduced beyond acceptable metal industry tolerances.

7.4 ASYMMETRICAL ASSEMBLIES

7.4.1 General

EN 1363-1 states that for separating elements required to be fire resisting from both sides, two test specimens shall be tested (one from each direction) unless the element is fully symmetrical, i.e. the construction of the door-set is identical on both sides of the centre line when viewed in plan (from above). However, in some cases it is possible to develop rules whereby the fire resistance of an asymmetrical door assembly tested in one direction can apply when the fire exposure is from the other direction. The possibility to develop such rules increases if the consideration is limited to certain types of door assembly and on the criteria being applicable (e.g. integrity only doors). The following rules represent the minimum level of common agreement which shall be followed. The rationale behind the rules is given in Annex C of EN 1634-1.

7.4.2 Specific rules

The rules governing the applicability of tests carried out in one direction to other directions are given in Table 2 and are based on the following premises:

- that each of the door leaves are themselves of symmetrical construction with the exception of the edges (e.g. lock/leading edge and hinge edge or double rebated doors);
- that any restraining/supporting elements of building hardware has been included in a test to EN 1634-1 when exposed in both directions so that they will retain their function when exposed to the heat of the test;
- that there is no change in the number of leaves or the mode of operation (e.g. sliding, swinging, single action or double action);
- that side, over and transom panels are excluded from Table 2 unless they are fully symmetrical.

Table 2 lists the type of door assembly for which rules can be generated and gives the direction in which it should be tested to cover the opposite direction. The separate columns for the integrity and insulation criteria reflect the different ability to make rules for integrity only doors as opposed to those which satisfy both criteria. A 'Yes' means that it is possible to identify the direction of test which covers the opposite direction. A 'No' indicates that it is not possible to identify the direction which will cover the opposite direction.

Table 2 — Type of door-set and direction to be tested to cover the opposite direction

Type of door-set	Direction to be tested to cover opposite direction	Integrity	Insulation	Radiation
Sliding/folding	Sliding/folding supporting components fixed on the face of the supporting wall on the fire side	Yes	No	No

7.5 SUPPORTING CONSTRUCTIONS

7.5.1 General

The fire resistance of a door assembly tested in one form of standard supporting construction may or may not apply when it is mounted in other types of construction. Generally, the rigid and flexible types are not interchangeable and rules governing the direct application within each group are given in 13.5.2 to 13.5.4 of EN 1634-1. However, in some cases it is possible for the result of a test on a particular type of door assembly tested in one form of standard supporting construction to be applicable to that door assembly when mounted in a different type of standard supporting construction. Specific rules governing the situation for hinged and pivoted door assemblies are given in 13.5.4 of EN 1634-1. The rationale behind the rules is given in Annex C of EN 1634-1.

7.5.2 Rigid standard supporting constructions (high or low density)

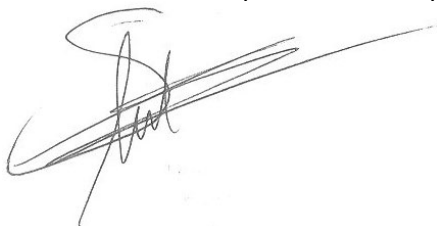
The fire resistance of a door-set tested in a high or low density rigid standard supporting construction as specified in EN 1363-1 can be applied to a door-set mounted in the same manner in a wall provided the density and the thickness of the wall are equal to or greater than that in which the door-set was tested.

7.6 ASSOCIATED SUPPORTING CONSTRUCTIONS

The fire resistance of a door tested in an associated supporting construction has no field of direct application. The applicability of the result to other supporting constructions shall be the subject of extended application.

8. LIMITATIONS

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



S. Lutz
 Project leader smoke control & resistance to fire



R.D. Scheepe B.Sc.
 Team leader resistance to fire

9. FIGURES

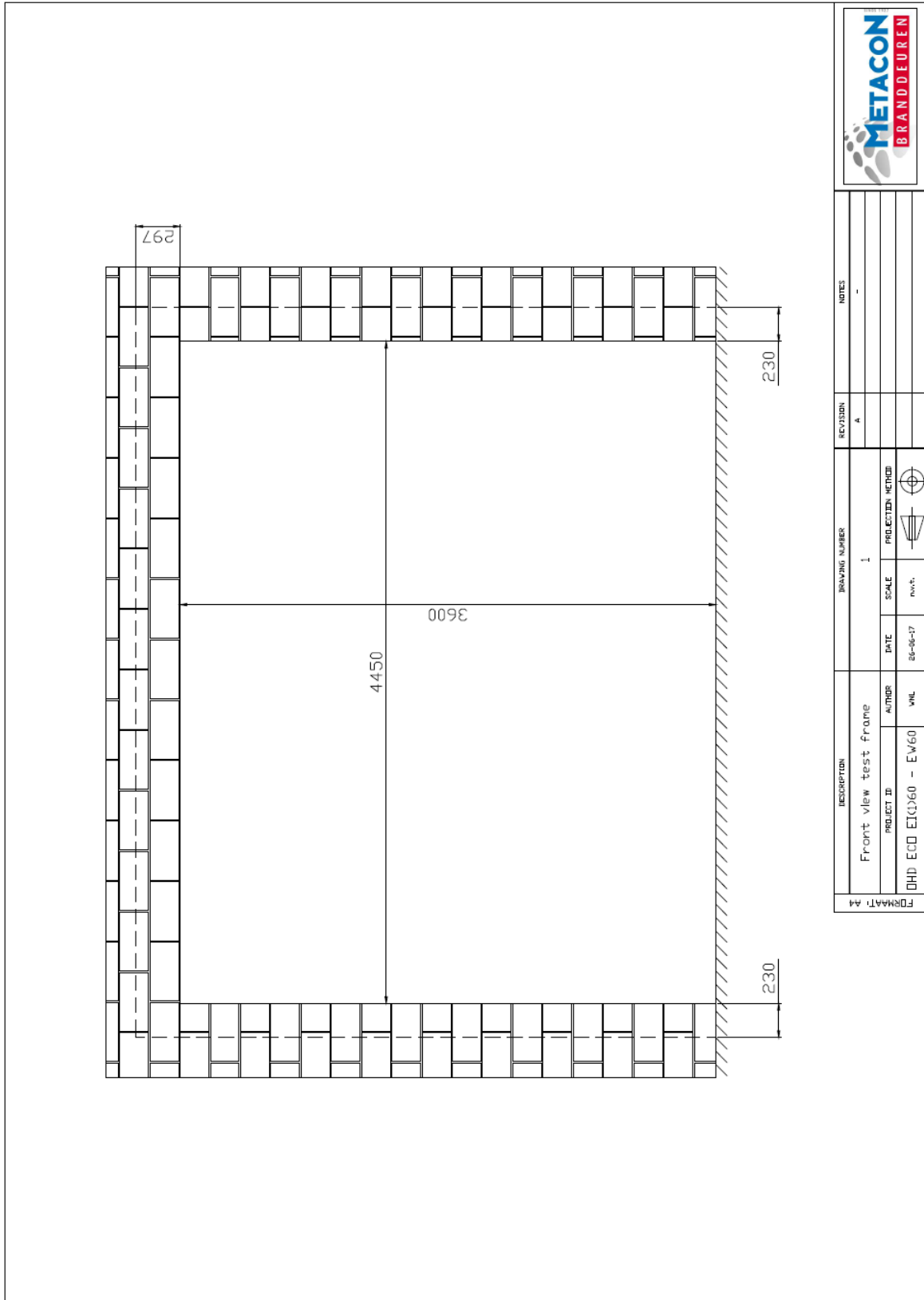


Figure 1 Aperture

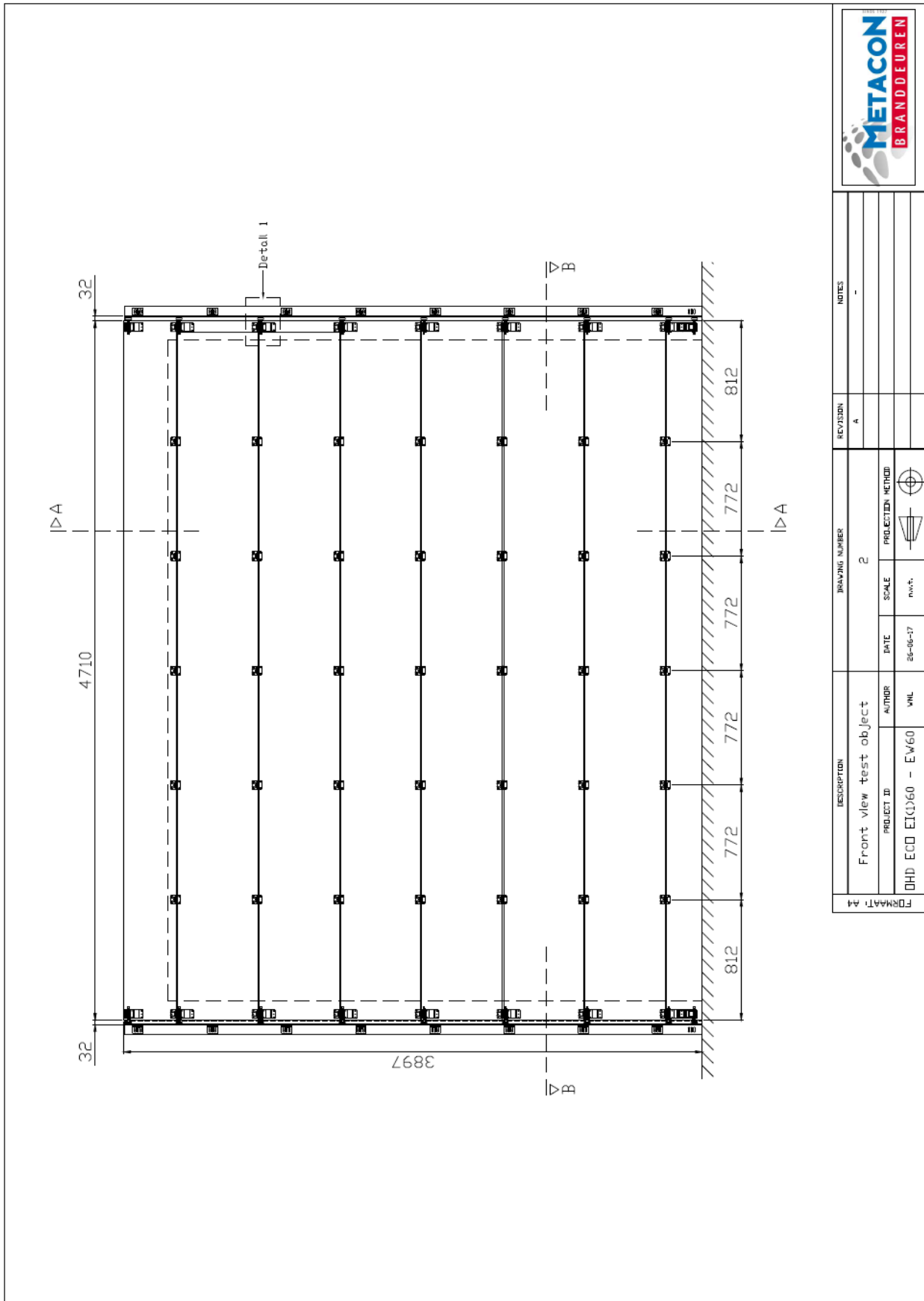


Figure 2 Front view

		NOTES	
REVISION A		NOTES -	
DRAWING NUMBER 2		PROJECT ID OHD ECO EI(1)60 - EW60	
DATE 26-06-17	SCALE n.v.t.	AUTHOR WHL	PROJECT METHOD
DESCRIPTION Front view test object		FORMAT A1	

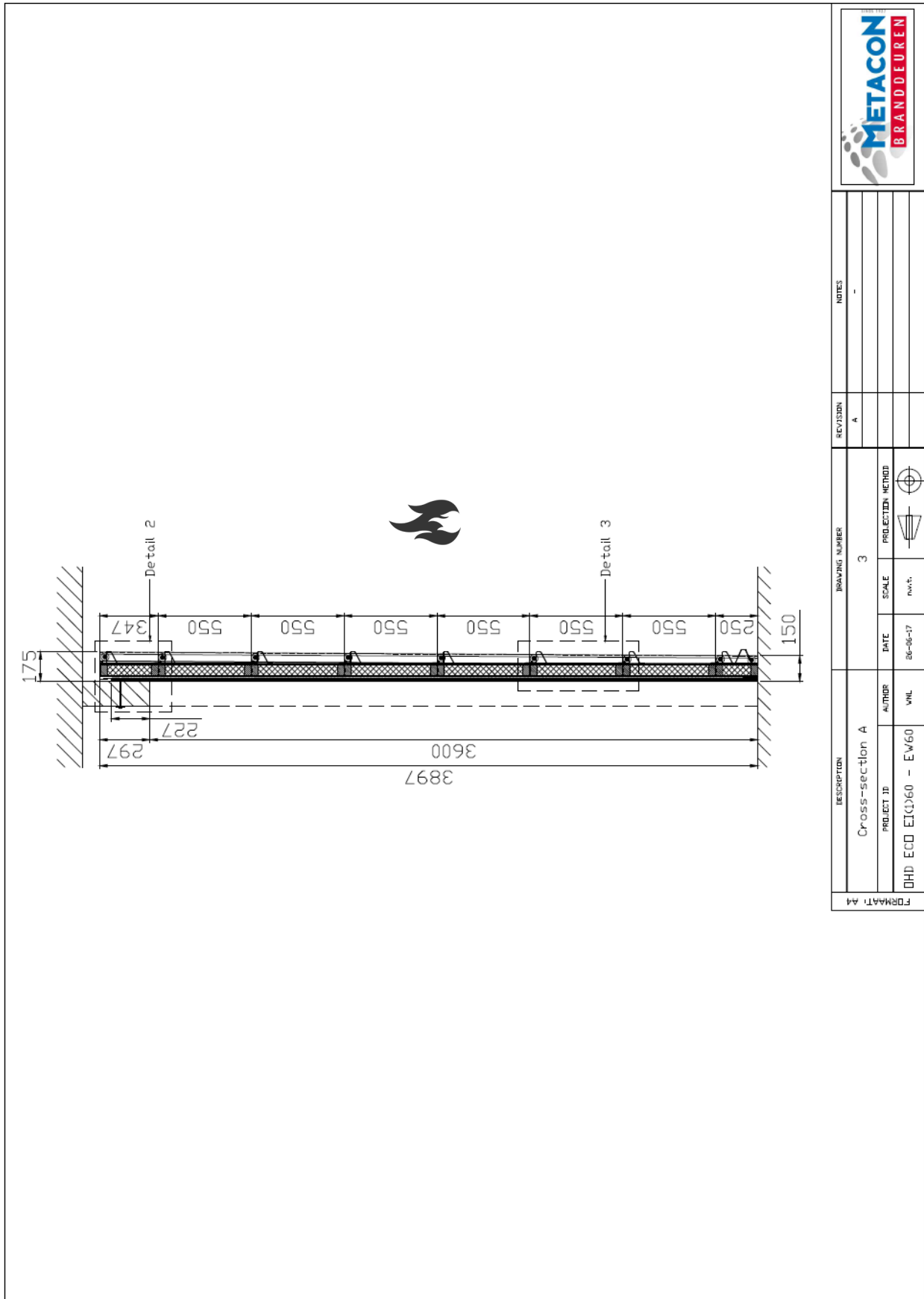


Figure 3 Section side view

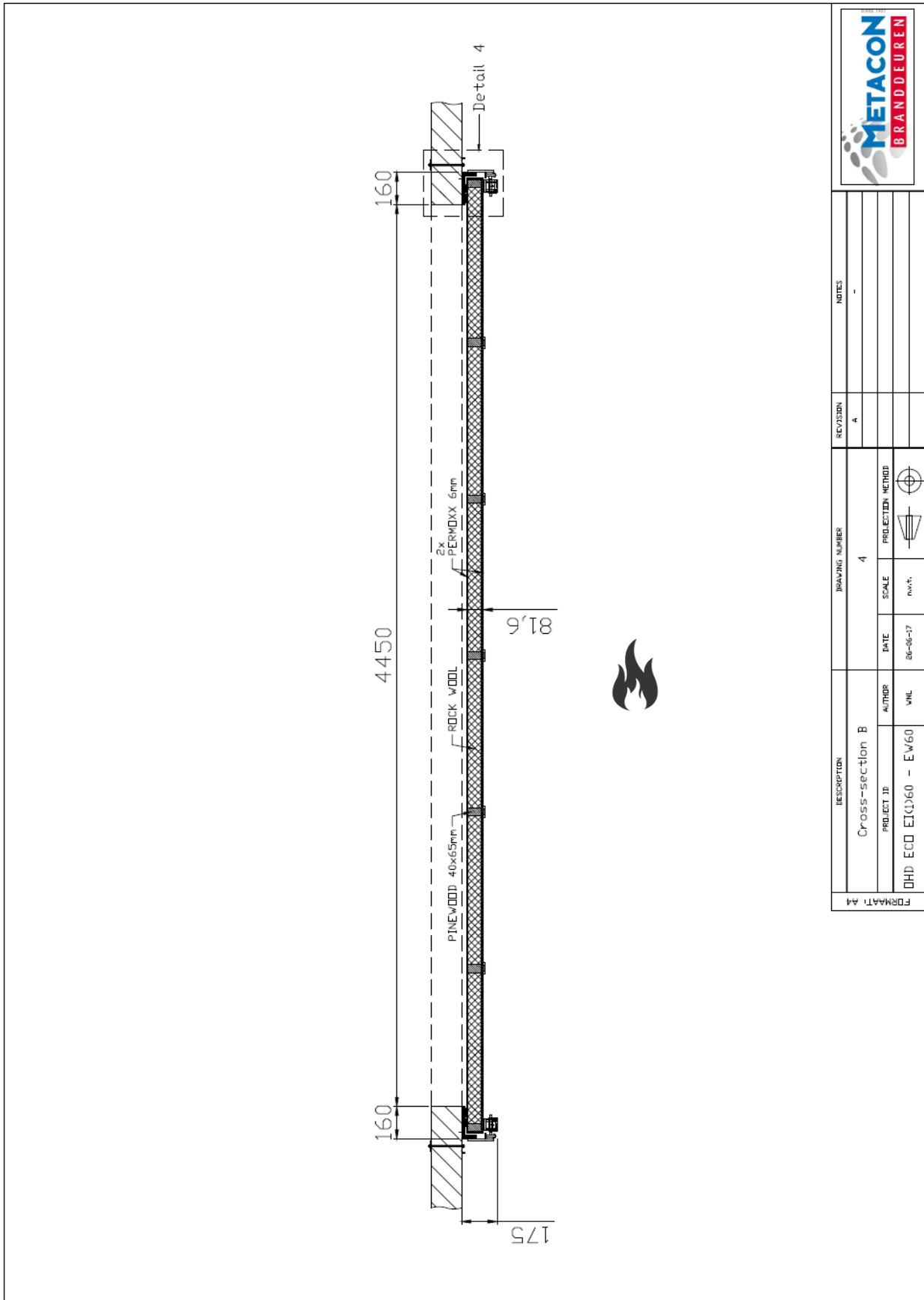


Figure 4 Cross section B