

Determination of the fire resistance according to EN 1634-1:2014 of a Gorter Wall-door Type B

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On behalf of Gorter Group BV, the fire resistance of a Gorter Wall-door type B was investigated by Efectis Nederland BV.

The examination was carried out according to EN 1363-1:2014 and EN 1634-1:2014. Details and results were noted in the Efectis report 2016-Efectis-R001165(Rev.2) dated December 2016.

A few of the details of the investigated construction are summarised below:

- The pivoting hatch lid was made of two riveted shells steel sheets insulated with rock wool and a double layer of fire resistant board, dimensions: 800 x 800 x 80 mm (l x w x t)
- Material layer at back side: Rockwool Steprock ND, thickness: 51 mm
- Material layers at lock side: Promaxon, thickness: 2 x 10 mm
- The square hatch frame was made of 2 parts of sheet steel, welded together forming an uninsulated tube, dimensions: 900 x 853 x 80 mm (w1 x w2 x t)
- The hatch was locked with a single-point lock. Manufacturer: Southco, type Cam Lock CM-C210
- Intumescent strips from Promat, type Promaseal GT were applied in and on the wall-door.

Test results

Summary of test results test I 13-09, door leaf pivoting away from the furnace

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 		Not determined Not determined Not determined No Failure
Insulation (I) <ul style="list-style-type: none"> ▪ Average temperature ▪ Maximum temperature I₁ ▪ Maximum temperature I₂ 	127 27 79	Failure, TC1 to TC5 Failure, TC9 Failure, TC17
Heat radiation (W)	162	No failure, max. 1.2 kW/m ² at 162 min.
The heating was terminated after 162 minutes in concurrence with the client.		

Summary of test results test II 15-09, door leaf pivoting towards the furnace

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 		Not determined Not determined Not determined No Failure
Insulation (I) <ul style="list-style-type: none"> ▪ Average temperature ▪ Maximum temperature I₁ ▪ Maximum temperature I₂ 	137 14 64	Failure, TC1 to TC5 Failure, TC7 Failure, TC12
Heat radiation (W)	160	No failure, max. 1.3 kW/m ² at 160 min.
The heating was terminated after 160 minutes in absence of the client.		

Classification according to EN 13501-2

Efectis classification report 2016-Efectis-R001221 dated January 2017, shows that in compliance with the conditions and direct field of application below a classification is given of: **E120, EI₁20, EI₂60 and EW120.**

Conditions and field of application

- 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 leafs and the mode of operation (e.g. sliding, single action or double action) shall not be changed.
- 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.
- 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 leafs or frames for which unfinished test specimens were tested.
- 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.
- 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.
- NOTE 2 Interchange of building hardware is not covered by the field of direct application.

- 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.
- 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

- The rules to cover increase or decrease of size without additional considerations are applicable only to six main product groups:
 - a) hinged and pivoted door-sets and openable windows;
- For Category 'A' tests with no overrun of classification period, no increase is allowed. Unlimited size reduction is permitted for all types except insulated metal doors where a reduction to 50% width and 75% height of the tested specimen is the limit of variation. Size increase is not permitted.
- For Category 'B' tests unlimited size reduction is permitted for all types except insulated metal doors where a reduction to 50% width and 75% height of the tested specimen is the limit of variation. Size increase is permitted only for those which are required to satisfy integrity or integrity and insulation and then only up to 15% in height, 15% in width and 20% in area.

Hatch opening away from the fire 13-09, Category 'B' overrun is applicable for EI₁ 20 and EI₂ 60.

Limits of permitted size increase			
Width (mm)	800	Increase width 15%	920
Height (mm)	800	Increase height 15%	920
Total surface (m ²)	0.64	Increase surface 20%	0.77

Hatch opening towards the fire 15-09, Category 'B' overrun is applicable for EI₂ 60.

Limits of permitted size increase			
Width (mm)	800	Increase width 15%	920
Height (mm)	800	Increase height 15%	920
Total surface (m ²)	0.64	Increase surface 20%	0.77

- For smaller door-set sizes the relative positioning of movement restrictors (e.g. hinges and latches) shall remain the same as tested or any change to the distances between them will be limited to the same percentage reduction as the decrease of test specimen size.
- For larger door-set sizes the following shall also apply:
 - ✓ the height of the latch above floor level shall be equal to or greater than the tested height, and such increase in height shall be at least proportional to the increase in door height;
 - ✓ the distance of the top hinge from the top of door leaf shall be equal to or less than that tested;
 - ✓ the distance of the bottom hinge from bottom of door leaf shall be equal to or less than that tested;
 - ✓ where three hinges or distortion preventers are used, the distance between the bottom of the door leaf and centre restraint shall be equal to or greater than that tested.
- 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.