

DETERMINATION OF THE FIRE RESISTANCE ACCORDING TO EN 1364-1:2015 OF A NON-LOAD BEARING PARTITION WALL WITH ABB HOLLOW WALL BOXES

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On behalf of ABB in Ede, the fire resistance is determined of a non-loadbearing flexible wall construction, comprising ABB Fire Retardant Hollow Wall Boxes with various wiring accessories.

The test is performed according to EN 1364-1:2015. Details and results are given in Efectis report 2016-Efectis-R000968 dated September 2016.

Some details of the investigated construction is summarized below:

Metal stud wall

Design of the wall is according KNAUF W112 with a thickness of 100 mm:

- Double 12.5 mm KNAUF gypsum board (GKB type A) on both sides
- Metal studs MS50, 600 mm c/c, with ALSIJJOINT between the studs and frame edges
- 3.5 x 35 mm screws, 1st layer of boards 600 mm c/c, 2nd layer of boards 200 mm c/c
- Edges between outer boards and frame kitted with SINIAT joint filler (standard gypsum board joint filler)
- SINIAT joint filler (standard gypsum board joint filler) and self-adhesive mesh
- Glass wool insulation SAINT GOBAIN ISOVER, KOMO 4087
- Rockwool insulation panels 210 in segments where junction boxes were mounted.

Summary of test results Knauf W112 wall with ABB Fire Retardant Hollow Wall Boxes

Criterion	Time (min.)	Result
Integrity (E)		
▪ Cotton pad	77	Not determined
▪ Gap Gauge:		
Ø 6 mm	77	Not determined
Ø 25 mm	77	Failure
▪ Sustained flaming > 10 seconds	77	Failure
Insulation (I)		
▪ Average temperature	77	No failure*
▪ Maximum temperature	66	Failure, ΔT 180 °C exceeded at TC8
Heat radiation (W)	0.5 kW/m ² at 77 min.	
* Determined by sustained flaming > 10 sec. = end of integrity E		
The heating was terminated after 77 minutes in concurrence with the client.		

Classification according to EN 13501-2:2007+A1:2009

Classification according to EN 13501-2:2007+A1:2009 is described in a separate report
The tested construction will be classified as follows: **EI60** and **EW60**.

Conditions and direct field of application

The test conditions and the results obtained when the specific partition wall of construction described herein was tested following the procedure outlined in EN 1363-1, and where appropriate EN 1363-2.

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.

- Decrease in height
 - Increase in the thickness of the wall
 - Increase in the thickness of component materials
 - Decrease in linear dimensions of boards or panels but not thickness
 - Decrease in stud spacing
 - Decrease in distance of fixing centres
 - The use of the tested hollow wall junction boxes at heights from 2400 mm to the bottom
 - Vertical joints of the type tested
- The width of an identical construction may be increased.
 - The allowed deflection of 100 mm was exceeded after 47 minutes. Therefore the height of the wall may be increased to 4 m for EW30 and EI45 criteria.
 - The result is applicable to high density rigid supporting constructions with at least the same fire resistance as the test specimen.

Based on the Field of Direct Application of Test Results other metal stud frame type A gypsum board walls, rock wool insulation 35 kg/m³, thickness 40 mm in ABB Fire Retardant Hollow Wall Box wall segments, with the same or a higher fire resistance and the same design as the tested Knauf W112 partition wall may also be applied like:

- Metal stud U profile 75 mm instead of 50 mm.
- A double wall, meaning a double row of metal stud U profiles 50 mm with a cavity between the metal stud frames.
- A double wall, meaning a double row of metal stud U profiles 75 mm with a cavity between the metal stud frames.

As there is no Field of Direct or Extended Application of Test Results for installations such as electrical sockets, etc. the application of the following ABB Fire Retardant Hollow Wall Boxes will be allowed based on the extrapolation of the test results surveyed in Efectis report: 2016-Efectis-R000968. As Hollow Wall Box type HW 52-F has not been tested yet, Efectis has made an assessment of the fire resistance of the box. The assessment is given in the Efectis document 2017-Efectis-R001729.

Type	Volume – WD (cm ³)	Volume – Collar (cm ³)	V-HWD/ V-Collar (%)	Tested by Efectis NL	EW	WBDBO
HW 180-F BW	207	7.8	3.8%	Yes	77	60
HW 150-F BW	223	9.2	4.1%	Yes	77	60
HW 195 BW	181	7.4	4.1%	Yes	77	60
HW 52-F BW	175	7	4.4%	No	-	-

The conclusion of the assessment is: Efectis Nederland expects ABB HW 52-F BW box to be fire resistant for at least 60 minutes for the criteria E and W.