



Test Report

Page 1 af 6

Encl: 12

DHL/NA/dhl

This is a translation of the
original Test report No.
G 10528, dated 1999-06-14

Examination of the fire-resistance of a vertical non-load bearing partition (Folding wall), with a built in door leaf, according to Danish Standard DS 1051.1 " Fire-resistance tests- Elements of building constructions" (identical with NT FIRE 005 and ISO 834).

1 Name of Sponsor

LPAB Produktion AB
Trastvägen 12
S-890 51 Långviksmom
Sweden

2 Date of test

1999-04-06.

3 Designation and principal components

Designation: LPAB 120

Wall and door leaf:	- Frame:	Pine 45×60 mm (wall elements) Pine 45×40 mm (door leaf)	
	Cover plate:	Chip board, 10 mm ,weight 6,7 kg/m ² 6 mm glass fibre reinforced plaster board (Gyproc GN6), density 5,6 kg/m ³	Inlay:
	Insulation:	Rockwool 337-00, 25 mm, density 140 kg/m ³	
	- Intumescent:	INTUMEX LSK 1,8×10 mm	
	Sealing strip:	Silicone U-profile, 10×10 mm Silicone P-fillet, 8 mm	
	Hinge:	Piano hinge, 50×1 mm	

The results relate only to the items tested.

The test report should only be reproduced in extenso – in extracts only with a written agreement with this institute.



Suspension: - Supporting rail: Aluminium U-profile, 55×55 mm
Supporting roller: Steel construction with four steel wheels

Covering: SECURIT 19 mm , surface weight 15 kg/m²

Door leaf: Rebates of hard-grained wood

4 Drawings and Description of the Test Specimen

The construction of the test specimen is shown in the enclosed four drawings No. SK001-99, ELETT0015, ELETT0016 and ELETT0017, carried out by the Sponsor. The drawings are supplied with the Danish Institute of Fire Technology (DIFT) stamp.

See also DIFT drawing no. 1.0.

Selection of the materials in the test specimen as well as the mounting was carried out by the Sponsor.

The test specimen consisted of five elements. One element functioned as a door leaf.

The thickness of the wall was 60 mm. The exposed area was about 3000×3000 mm.

The elements were constructed symmetrically around a frame of pinewood. Inside the frame the insulation was mounted, and covered on both sides by 6 mm thick plasterboard. The entire construction was covered by a 10 mm thick chipboard.

The elements were suspended in a rail (aluminium) by two supporting steel rollers. The covering around the rail was made of 19 mm Securit, and the joints were sealed with SIKA FIRESIL.

The wall elements were joined with piano hinges all along the height of the elements. In the joints between the two elements were mounted 2 strips of INTUMEX LSK 1,8×10 mm and an elastic sealing strip. The hinges were mounted so that the wall could be opened at the middle and be parked at both sides.

Along the elements upper- and underside was mounted two elastic sealing strips (U-profile, 10×10 mm), which closed the gap between the lower edge of the elements and the frame and between the upper edge of the element and the covering around the rail.

In the joint between the element that functioned as a door leaf (closing side) and the neighbouring element were mounted four strips of intumescent seal. In addition an elastic sealing strip was mounted on the door leaf and on the opposite wall element.

In the door leaf was a lock type: ASSA Ruko SYM (latch-/bolt lock). The lock had the external dimensions 17×150×75 mm (w×h×depth). The cut-out for the lock had the dimensions 22×172×90 mm.



Each wall elements had one or two barrel bolts (see the sponsors drawing no. SK001-99. The width of the cut-out was 13 mm. Around the operator unit the frame wood was cut through over a length of 290 mm. The remaining part of the cut-out had a depth of 20 mm.

5 Test conditions

The test is carried out in accordance with the Danish Standard DS 1051.1 test procedure together with relevant parts of DS 1051.2.

The test specimen was mounted in a 200 mm thick concrete frame with a clear opening of 3000×3000 mm. The test specimen was attached through the running rail to the concrete frame per 400 mm, and per 500 mm along the vertical sides.

Before the test all barrel bolts were activated in the wall elements.

Just before the test, the door was manual closed and kept in closed position by the latch of the lock. The bolt was not activated during the test.

The entire test specimen was placed as front of the DIFT vertical furnace. The test specimen was tested with the wall placed so that the door leaf opened away from the furnace chamber.

DIFT drawing No. 1.0 shows the position of the thermocouples for measuring the temperature rise on the unexposed side of the surface of the test specimen.

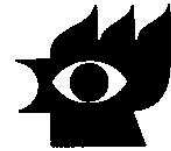
During the test the pressure in the furnace was kept equal to the pressure in the laboratory at a point located at approximately one-third of the height of the test specimen.

6 Test results

Table 2 and the graph, drawing No. 2 shows the actual minimum-, average- and maximum Furnace temperature rising in relation to the standard temperature rise. Table 2 also shows the area under the actual time-temperature curve as well as the area under the standard time temperature and the percentage deviation between the to areas.

Table 3 and the graph, drawing No. 3 show the temperature rise of the thermocouples positioned on the unexposed surface of the specimen.

During the test, the test specimen was kept under constant observation. The numbering of the elements in the observations is shown at DIFT drawing no. 1.0. Relevant observations are noted in the following summary:



Time in minutes	Observations	E = exposed side U = unexposed side
0	Test commences.	
3	(U) Weak smoke development from the top 1/3-part of the joint between the door leaf and the other elements.	
5	(U) Heavy smoke development from the top 1/4-part of the joint between the door leaf and the wall element No. 2.	
7	(U) A little discoloration on the top 1/3-part of the wall element No. 2, along the joint against the door leaf.	
9	(U) Increasing discoloration of the top 1/2-part of the wall element No. 2, along the joint against the door leaf.	
14	(U) Weak smoke development along the top of the door leaf and by the top right corner in the hinge side of the door leaf.	
17	(U) Weak smoke development by the top of the row of holes on the wall elements (for operation of the barrel bolt).	
20	(E) The rebate is gone. Pieces of boards (chipboard and/or plaster) have fallen down.	
24	(E) Even more boards have fallen down.	
25	(U) Moderate smoke development from the top row of holes on the wall elements and along the top 1/2-part of the joint between the door leaf and wall element No. 3 (hinge side).	
30	(U) Spots of discoloration along the joint between wall element No. 1 and 2.	
37	(U) Weak discoloration alongside the top 1/4-part of the assembly between the door leaf and the wall element No. 3 and at the same height between the wall element No. 3 and 4.	
43	(U) The joint between the wall element No. 1 and 2 is starting to open, because the two wall elements have moved against the unexposed side.	
43 3/4	(U) Sustained flaming in the joint between wall element No. 1 and 2. Test stopped.	

The horizontal deformation of the wall measured at thermocouple No. 5:

Time in minutes	0	5	10	15	20	30
Deform. [mm]	0	11	11	1	0	-42

(Negative values means deformation against the unexposed side)



The bending of the door leaf in the locker side, measured relative to the wall element No.2 was:

Time in minutes	0	5	10	15	20	25	30
Top [mm]	0	1,0	2,4	7,8	11,0	12,3	13,2
Bottom [mm]	0	-0,6	0,4	-1,7	-3,0	-3,0	-3,1

(Negative values means that the relative distance between the wall element and the door leaf is reduced)

The photographs Nos. 1 - 5 on the attached photos shows:

1. The test specimen at the start of the test.
2. The test specimen after 15 minutes testing time.
3. The test specimen after 30 minutes testing time.
4. The test specimen after 43¼ minutes testing time.
5. Exposed face of the test specimen after the test.

7 Conclusion.

Fire-resistance testing according to DS 1051.1 (identical with ISO 834 and NT FIRE 005) of the construction described in this report showed that failure occurred in relation to the performance criteria stated in the fire resistance standard after following time, expressed in minutes:


Integrity 43 min. After 43¼ minutes of testing sustained flaming was observed on the unexposed side of the test specimen in the joint between wall element No. 1 and 2.

Insulation: 43 min. The isolation has stopped because of failure of integrity.

A wall constructed as described in this test report meets the requirements stated in DS 1052.1 for a wall bearing the type designation

BD-wall 30

The test result relates only to the item tested.


Niels Andersen
Head of laboratory


Dan Lauridsen

LPAB Produktion AB
Trastvägen 12
S-890 51 Långviksmom
Sweden