Fire technical assessment

Name of sponsor:	**Bygcom A/S**
Product name:	Fermacell 1S32 – EI90
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Ref:	MKL / NOL

Danish Institute of Fire and Security Technology

Symmetrical non-loadbearing wall

Bygcom A/S has asked the Danish Institute of Fire and Security Technology (DBI) about a fire technical assessment regarding a non-loadbearing wall construction.

Two similar walls have been tested; a non-loadbearing wall after EN 1364-1, and a loadbearing wall after EN 1365-1. The question concerns the possibility to assess the wall to EI90 by replacing the studs with similar studs of a greater thickness and adding an extra row of studs with stone wool insulation, in the construction. A drawing of the wall is attached to this assessment.

Fire technical documentation

Bygcom A/S has referred to the following documentation:

Reports	Laboratory	Dated	Standard	Product	Results
PG11026	DBI	14-05-2002	EN 1364-1:1999	Non-loadbearing wall	E: 105 min I: 94 min
PGA11146A	DBI	07-02-2018	EN 1365-1:2012	Loadbearing wall	R: 62 min E: 62 min I: 62 min

Fire technical rationale

For this fire scenario, Bygcom A/S wishes to build a wall as shown on the attached drawing that follows the criteria for EI60:

DBI have evaluated the above-mentioned variations with regards to the two failure criteria's, Integrity (E) and Isolation (I).

In test report PG11026, the wall was tested as a non-loadbearing wall with two layers of Fermacell fibre boards (12.5 + 10.0 mm) on each side of cc 600 mm steel studs with a width of 70 mm and a steel thickness of 0.56 mm. Stone wool insulation of nominal density 30 kg/m³ was mounted between the steel studs. The wall failed because of a maximum temperature rise exceeding 180 °C after 94 minutes.

In test report PGA11146A the wall was tested with an applied load of 28 kN/m and consisted of two Fermacell fibre boards on the exposed side a 12.5 mm and a 15 mm and an calcium silicate board on the unexposed side. The studs designated U C89S42-1.2 (Bygcom Stålprofiler) were placed with a c/c of 450mm with glass wool insulation in between. The studs were 89 mm wide with a steel thickness of 1.2 mm. Glass wool insulation of nominal density 15-20 kg/m³ was mounted between the steel studs. The wall failed the loadbearing criteria at the 62 minute because the load could not be maintained.

The construction shown on the attached drawing consist of two layers of Fermacell fibre board (10 + 12.5 mm) on one side and one layer of 12.5 mm Fermacell fibre board on the other side of two rows of c/c 600 mm steel studs with a width of 75 mm and a steel thickness of 1.2 mm designated Bygcom 75x1.2. The two rows of studs are placed 20mm apart. Stone wool insulation with a nominal density of at least 30 kg/m³ is mounted between both rows of steel studs.

Wall:	Assessed wall	PG11026	PGA11146A
Boards side 1:	10 + 12.5 mm Fermacell fibre boards	10 + 12.5 mm Fermacell fibre boards	15+12.5 mm Fermacell fibre boards
Boards side 2:	12.5 mm Fermacell fibre boards	10 + 12.5 mm Fermacell fibre boards	10 mm Calcium silicate
Steel studs:	2 x 75 mm wide; 1.2 mm thick	75 mm wide; 0.56 mm thick	89 mm wide; 1.2 mm thick
Stud cc	C/C 600 mm	C/C 600 mm	C/C 450 mm
Insulation	2 x stone wool 30 kg/m³	Stone wool 30 kg/m³	Glass wool 15-20 kg/m³
Resistance to fire:	EI90	EI90 + 4 minutes overrun	REI60 + 2 minutes overrun

The changes to the assessed wall is the type and thickness of the studs and the added extra row of studs with stone wool insulation. The change in stud type and the increase in stud and the extra row of studs will not deteriorate the performance of the wall and can in some cases improve the stability of a wall during a fire test.

Based on the given documentation, DBI assesses that the wall shown on the attached drawings fulfils the requirements for a non-loadbearing wall with the classification EI90.

Assessment

It is the opinion of DBI that the non-loadbearing wall described above and shown on the attached drawing, fulfils the requirements for a non-loadbearing wall with the classification

Assessed DK EI90

Conditions:
– The following changes are allowed (taken from the DIAP in EN 1364-1:2015)
  - Decrease in height (max 3000 mm)
  - Increase in the thickness of the wall (minimum 215 mm thick)
  - Increase in the thickness of component materials
  - Increased in the width of the studs
  - Decrease in linear dimensions of boards but not thickness
  - Decrease in stud spacing
  - Decrease in distance of fixing centres
  - Increase in the number of horizontal joints
  - Unlimited increase in the width of the wall
– All other details must be constructed as described in test report PG11026

Validity

This assessment is issued on the basis of test data and information available at the time of the issue. If contradictory evidence becomes available to DBI the assessment will be unconditionally withdrawn, and the manufacturer will be notified in writing. Similarly the assessment is invalidated if the assessed construction is subsequently tested because actual test data is deemed to take precedence over an expressed opinion. The assessment is valid for 5 years from the date of issue. DBI must reassess the validity after this period.

The assessment is only valid provided that no other modifications are made to the tested construction, other than those described in this report.

Limitation

This is a national assessment and cannot be equated with a classification based on EN 13501-2.
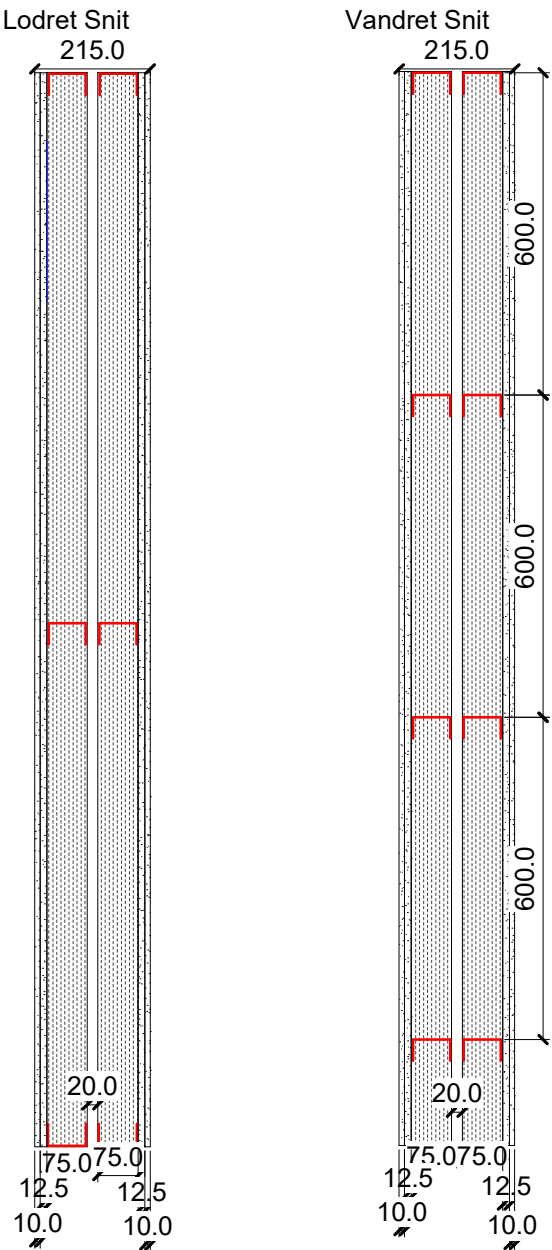
Danish Institute of Fire and Security Technology

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Denmark

Lodret Snit
215.0

Vandret Snit
215.0

600.0

600.0

600.0

20.0

20.0

75.0 75.0
12.5   12.5
10.0   10.0

75.0 75.0
12.5   12.5
10.0   10.0

DBI
PHA11192A

Fermacell 1S32 som Fermacells opbygning - EI90
Max. 3m høj

10. Fermacell 1S32 – EI90 på 10+12mm- 10+12mm Fermacell fiber gips, Bygcom studs min. 2X75x1.2mm cc max. 600mm og 2 x stenuld på minimum 30kg/m³. Max. 3m høj.