DBI
FIRE AND SECURITY

FIRE TECHNICAL ASSESSMENT

Name of sponsor:	Tekment A/S		
Product name:	REI30 wall + Corner solution		
File no.:	PHA11160A	**Revision:**	1
Date:	29-06-2022	**Expiry date:**	29-06-2027
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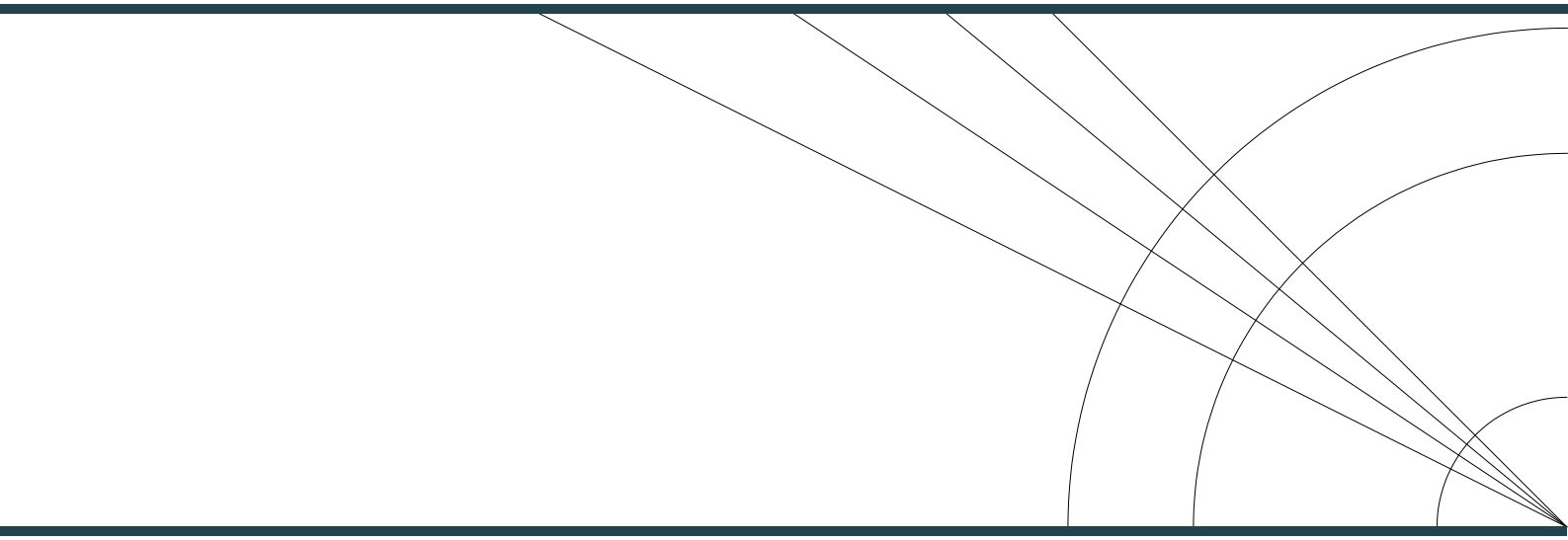
Ref:	JBK / CAN		



Danish Institute of Fire and Security Technology
Jernholmen 12, DK-2650 Hvidovre
Phone: +45 36 34 90 00 · Mail: dbi@dbigroup.dk · www.dbigroup.dk

Client information

Client: Tekment A/S

Address: Bakkevej 19

5750 Ringe

Denmark

The results relate only to the assessed item. The report should only be reproduced in extenso - in extracts only with a written agreement with Danish Institute of Fire and Security Technology - DBI.

Revision chronology

Rev. no.	Date	Description	Author	Approved
0	16-01-2019		NOL	CAN
1	29-06-2022	Added assessment on corner solution. Changed from old assessment report design to new design.	JBK	CAN

Loadbearing wall

Tekment A/S has asked the Danish Institute of Fire and Security Technology (DBI) about a fire technical assessment regarding a loadbearing wall construction.
The loadbearing wall has been tested after EN 1365-1. The question concerns the possibility to assess the wall REI30 with reduced load and to assess a corner solution. Drawings of the wall can be found in the test report PGA11319A.

Fire technical documentation

Tekment A/S has referred to the following accredited documentation; one test report tested in accordance with EN 1365-1:2012

Report	Laboratory	Dated	Standard	Type of test	Product
PGA11319A	Danish Institute of Fire and Security Technology	18-12-2018	EN 1365-1:2012	Loadbearing wall	R: 29 min E: 29 min I: 29 min

Fire technical rationale: Reduction in load

For this fire scenario, Tekment A/S wishes to maintain the wall as tested and only reduce the load, so that the wall reaches REI30.

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

Regarding the Integrity (E) and Isolation (I) criteria's, the results of the wall test shows that temperature rise on the unexposed side reached 0.4°C at the end of the test (the failure criteria is 180°C) and there was no sign of hot gasses or openings on the unexposed side. The failure of the Integrity (E) and Isolation (I) criteria only occurs due to the failure of the loadbearing criteria. DBI evaluates that for this specific type of construction the critical failure criteria is the loadbearing and if this is obtained the Integrity (E) and Isolation (I) criteria are passed as well.

Regarding the loadbearing criteria (R):
The wall was tested with an applied load of 25.7 kN/m. The wall failed the loadbearing criteria at the 29th minute because the load could not be maintained. The applied load dropped down to 19.6 kN/m in the 29th minute but was on 23.8 kN/m when the test ended in the 31st minute.

If the load is reduced to 18 kN/m DBI evaluates that the loadbearing capacity can be maintained for at least 30 minutes. 18 kN/m are lower than the minimum load applied during the test which was 19.6 kN/m. Furthermore, the wall showed that is was able to withstand a load of 23.8 kN/m in the 31 minute after it had failed.

In addition to this, reduction of the load will also delay the deformations of the wall and therefore reduce the bending moment caused by the horizontal deformation, increasing the time to failure.

With the reduction in load, it is the opinion of DBI that the test specimen will fulfil the requirements for loadbearing capacity for at least 30 minutes.

Fire technical rationale: corner solution

Tekment A/S has asked DBI to assess at corner solution for their loadbearing wall. The corner is built after the same principles as the tested loadbearing wall. It is a symmetrical solution with 18 mm fiber cement boards on both sides of

the PUR foam insulation. The wall is produced in elements and the tested joints between the elements had an overlap of 60 mm cement bonded particle board. The principle from the joints have been used in the corner solution, where two strips of 18 x 100 mm (thickness x width) Fermacell fiber gypsum board is placed to protect the corner from opening up during a fire. The fiber gypsum board adds a cooling effect. The strips are fixed to the outer boards in the same manner as the tested joints. The protective strips are creating the approximately the length of cover as the joints between the elements before the PUR insulation is exposed to fire in the test scenario. The corner solution is assessed to perform as the tested wall.

Assessment

It is the opinion of DBI that the loadbearing wall described above, with the change as described above, fulfils the requirements for a loadbearing wall with the classification

Assessed DK REI30

Conditions:

- Loadbearing part of the construction must be constructed as described in test report PGA11319A
- The maximum allowed loading on the wall is 18 kN/m
- The maximum allowed height of the wall is 3014mm
- The wall may only be used in buildings where the height to the top floor is below 5.1 m measured from terrain level
- The corner solution as in drawing 09-06-2022 - 1
- The strips in the corner solution is 18 x 100 mm Fermacel fibergypsum board and are fixed in the same manner as the tested joints.
- The following changes are allowed and a taken from the DIAP in EN 1365-1:2012:
  - Decrease in height
  - Increase in the thickness of the wall (tested 338mm thick)
  - Increase in the thickness of component materials
  - Decrease in linear dimensions of boards but not thickness
  - Decrease in stud spacing
  - Decrease in distance of fixing centers
  - Increase in the number of horizontal joints
  - Unlimited increase in the width of the wall

Validity

This is an assessment and cannot be equated with a classification based on EN 13501-2.

This assessment is written in accordance with EGOLF Recommendation 026-2018. The Assessed (DK) is stated in accordance with the recommendation as to specify the country in which the assessment has been written. Validity in other countries is subject to acceptance by the relevant national authorities/regulations.

DBI is an accredited test laboratory in accordance with EN 17025 and provides expert consultancy in regard to the above mentioned EN standards.

This assessment does not consider any national rules or requirements from national building codes. The assessment concludes that if the mentioned variations are implemented, the modified construction will be able to pass the required performance criteria for the assessed time period, in accordance with the referred EN standard, if tested.

This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to the assessing authority the assessment can be unconditionally withdrawn and the applicant will be notified in writing. Similarly the assessment is invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence over an expressed opinion. This assessment is only valid for 5 years, after which time it is recommended that it be submitted to the assessing authority for re-appraisal.

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

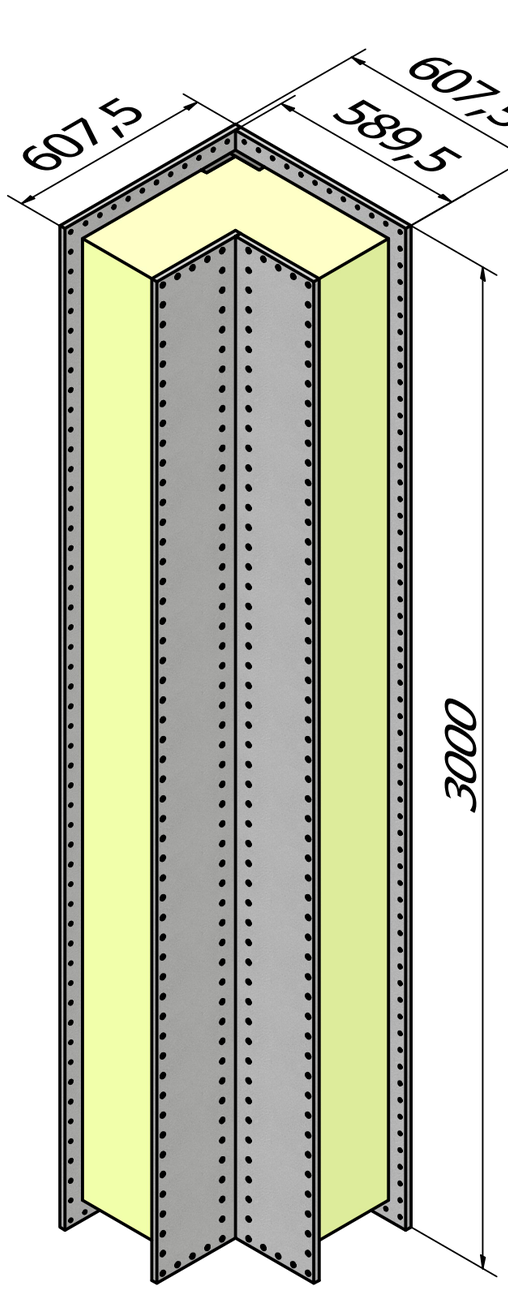
For use in Denmark the following information is relevant (in Danish)

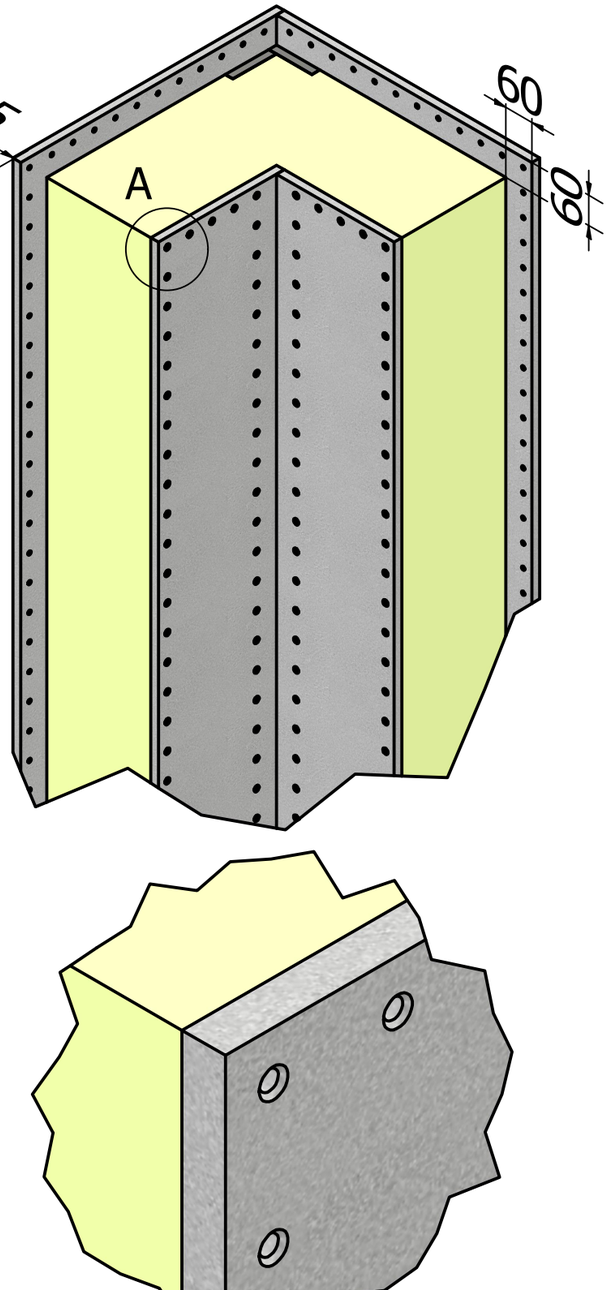
Bygningsreglementets vejledning og bilag til kapitel 5 – Brand beskriver, at præ-accepterede løsninger forudsætter anvendelse af byggevarer og bygningsdele indenfor de forudsætninger, der er fastlagt for produktets klassifikation. Anvendelse af byggevarer og bygningsdele uden for det anvendelsesområde, der er defineret for produktet, kan have betydning for den brandstrategi, der udarbejdes for det konkrete byggeprojekt. Det er derfor vigtigt, at byggeprojektets brandrådgiver er informeret om disse forhold. Der henvises i øvrigt til bygningsreglementets vejledning til kapitel 5 – Brand, Kapitel 8.7 omkring eftervisning og brandklasse. Det er DBI's vurdering, at denne bedømmelse falder under b) i afsnit 8.7, hvorved dokumentet kan anvendes som dokumentationsform for bygninger i alle brandklasser, uden at denne bedømmelse ændrer bygningens brandklasse.

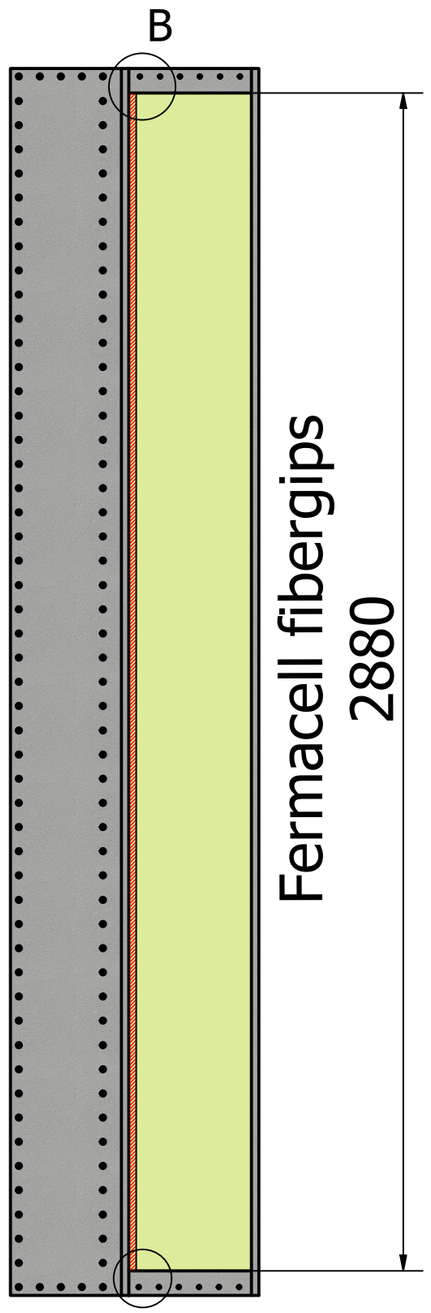
Danish Institute of Fire and Security Technology

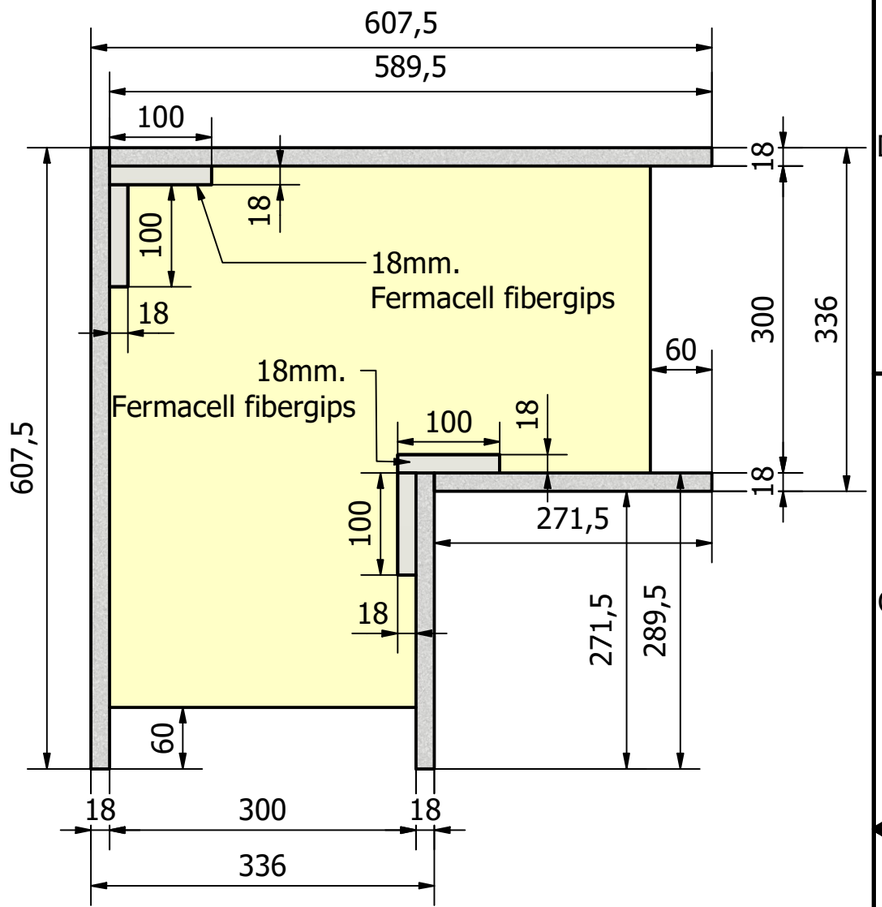
Jeanne B Kirk
M.Sc. (Eng)

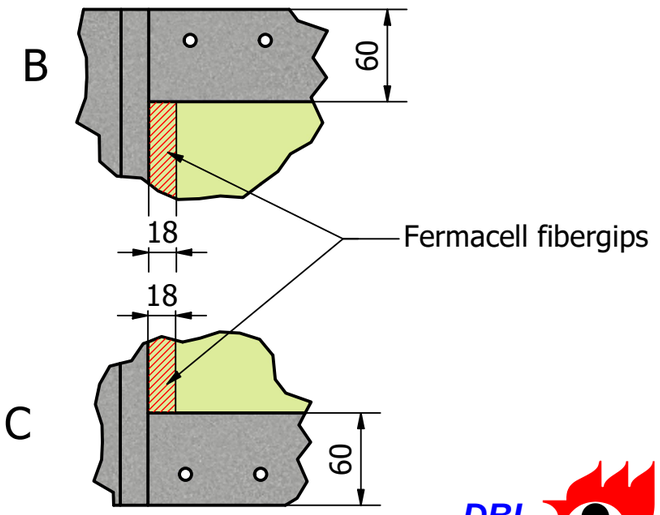
Christian B.Andersen
M.Sc. (Civ.Eng.)











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Designed by	Checked by	Approved by	Date		Date	
DBM					11-05-2022	

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