FIRE TECHNICAL ASSESSMENT

Name of sponsor:	STO Danmark A/S		
Product name:	StoTherm		
File:	PHA12090A	**Revision:**	1
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Pages:	6	**Enclosures:**	1
References:	BPE / CAN		

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Sponsor information

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Revision chronology

Rev. no.	Date	Description	Author	Approved
0	25-09-2025		CAN	BPE
1	31-10-2028	Small changes and editorials	CAN	BPE

Assessment of StoTherm Mineral

STO Danmark A/S has asked DBI – Danish institute of Fire and Security Technology about a fire technical assessment of their covering designated “StoTherm” – See illustration in enclosure no. 1.

The customer wants DBI to assess whether StoTherm Mineral and StoTherm Classic L/MW will fulfil the requirements for a covering with the classification K_1 10 / B-s1,d0.

Fire technical documentation

STO Danmark A/S has referred to the following accredited documentation.

Primary documentation:

Classification report	Laboratory	Dated	Standard	Based on test report	Classification
PCA10161	DBI	2014-10-20	EN13501-2:2007 + A1:2009	PGA10506A PGA10506B	K_2 60
231001669-3	MPA NRW.	2022-12.20	DIN EN 13501-1	Stated in the classification report	A2-s1,d0

Secondary documentation:

Test report	Laboratory	Dated	Standard	Product
904 3018 000	MPA	2024-01-19	EN 1363-1:2020 and DIN 4102-8:2000	R&D test with dowels
9043796000	MPA	2024-12-08	EN 1363-1:2020 and DIN 4102-8:2000	R&D test with dowels

Datasheet - Sto-Stone Wool Insulation Board Type 0/D - Classification A1
Datasheet - Sto Minerallamel – Classification A1
Safety data sheet (EJOT) – Plastic dowel – Melting point 130-150 ◦C

Variation: Fasteners

STO Danmark A/S has asked DBI to assess the following fasteners and mounting options.

1. Covering with Sto-Dispersion adhesive with and without mechanical anchors including façade render finish

- Lowered Plastic dowel, Stone wool cap, fibre mesh and façade render/plaster
- Lowered Steel screw, steel penny washer, Stone wool cap, fibre mesh and façade render/plaster
- Only attach with Sto-Dispersion

Fire technical rationale

StoTherm Mineral and StoTherm Classic L/MW are non-combustible façade systems (ETICS) for the external insulation of buildings. The system consists of mineral wool insulation with a thickness of min. 60mm, which is bonded to the substrate using adhesive with or without mechanical anchors. A reinforcing layer with a min. thickness of 5mm is applied over the insulation, consisting of plaster with an embedded glass fibre mesh. The system is finished with a primer when needed, and a final render, which can be mineral, silicate-based, or organic, optionally with a decorative surface coating.

The system itself is therefore constructed exclusively from non-combustible materials, apart from the plastic plugs and the glass fibre mesh (non-substantial layer). The cladding serves the purpose of protecting an underlying combustible material, which is achieved according to the following criteria:

- The temperature rise measured between the covering and the substrate must not be above 250°C in average and 270°C maximum.
- The substrate must not be charred, melted, shrunk or otherwise visually changed after the test.

PGA10506B which was a test of a similar product (it also included a 12,5 mm thick gypsum fibre board) showed the following results:

- The maximum average temperature rise measured was 92 °C

And

- The maximum temperature rise measured was 95 °C

There was **no** collapse of the covering, ignition or charring of the chipboard and brunt, charred, melted or shrunken material. The results and observations mentioned above are after 60 minutes of testing, which indicates that after the required 10 minutes, the temperature on the backside of the product will not exceed the requirements and must be assumed to be below the criteria stated in EN 14135 after 10 minutes on the backside of the 60 mm insulation.

Regarding the plastic dowels which are the only combustible elements in the construction and therefore the ones that require fire protection it is shown in test report no. 904 3018 000 and 9043796000 that several development tests have been tested on a StoTherm system where a measurement point was 30 mm down in the insulation layer. In test report 9043018000 test specimen 1 had three internal thermocouples placed 30 mm into the insulation and the temperature measured after 10 minutes was a maximum of 150 degrees and an average of 100 degrees. Other tests in 9043796000 showed lower temperatures.

The façade plugs are mounted deeper in the insulation layer with a depth of approximately 40 mm. Then protected by a stone wool cap and finished with façade render/plaster. Therefore, the assessment that the temperatures measured 30 mm down in the insulation layer, can be used to assess that the façade plugs will be protected for at least 10 minutes if 40 mm insulation covers the plugs.

Therefore, since the plastic plugs are protected within the first 10 minutes, the criteria for a covering is assessed to be fulfilled. On the backside of the insulation layer the temperature also meets the criteria for the K_1 10 covering.

The 60 mm insulation layer tested in PGA10506B did not fall down during the 60-minute test. The insulation was attached with approx. 1 mm thick Sto-Dispersion adhesive.
STO Danmark also want DBI to assess Sto Byggeklæber as attachment method. Since the temperature in in test report no. 904 3018 000 and 9043796000 show temperaturerises around 25 degrees behind the 60 mm insulation after 10 minutes of testing, it is DBI conclusion that the glue will not be a effected and therefor will be able to hold the covering in place as in cold condition

Fire technical assessment

Based on the above mentioned, it is DBI's opinion that StoTherm Mineral and StoTherm Classic L/MW mounted with lowered plastic dowel and lowered steel screw, will fulfil the requirements for a covering within the classification

Assessed DK K_1 10 /B-s1,d0

On the following conditions:

- Dowels used must be recessed min. 40mm
- All façade dowels must be covered by 40 mm Sto-Stone Wool Insulation Board Type 0/D

- Insulation base layer must be min 60mm and glued to the substrate with approx. 1mm thick Sto-Dispersion adhesive or Sto Byggeklæber as appropriate in cold condition.
- A min. thickness of 5mm Plaster must be applied with embedded fibre mesh and have the reaction to fire classification of A2-s1,d0 or better
- No more than 6 façade anchors must be used pr m^2
- The substrate is masonry, concrete or similar A1 or A2-s1,d0 substrates with a density of min. 525 kg/m3.

Validity

This is an assessment and cannot be equated with a classification based on EN 13501-2:2023

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 17025:2017 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

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Reaction to Fire Engineer

Christian Andersen
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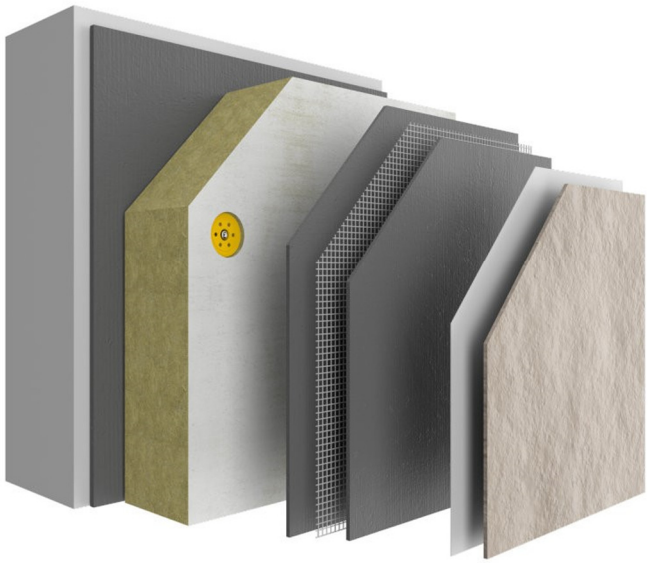
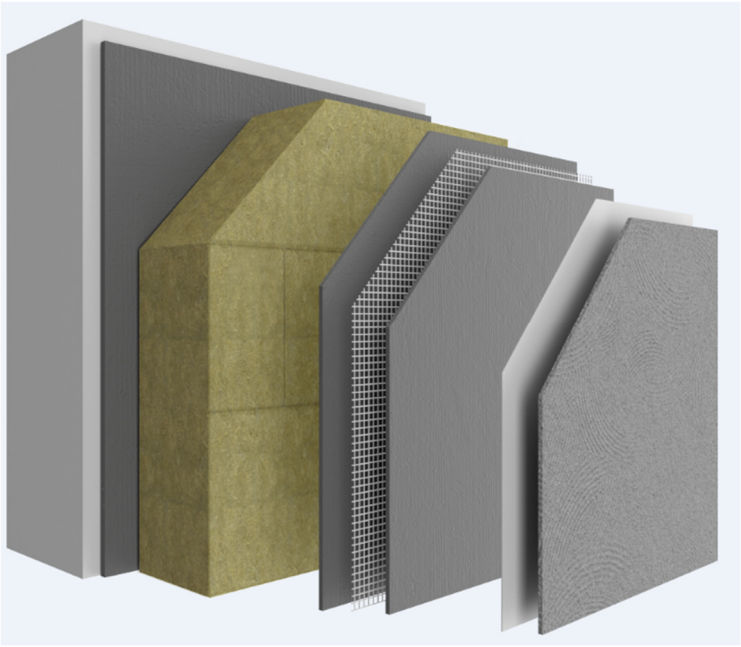
StoFacadebatts



StoMinerallamell



Principsnit facadeopbygning

StoTherm Mineral
Vertikalt snit
Klæbet og mekanisk fastgørelse

Rev-Nr. 01/08.10.2010

WM 010