SINTEF Technical Approval

TG 20411

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Valid until 01.06.2027

Provided listed on
www.sintefcertification.no

SINTEF confirms that

Cembrit Windstopper

has been found to be fit for use in Norway and to meet the provisions regarding product documentation given in the regulation relating to the marketing of products for construction works (DOK) and regulations on technical requirements for building works (TEK), with the properties, fields of application and conditions for use as stated in this document

1. Holder of the approval

Cembrit Holding A/S
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9000 Aalborg, Denmark
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2. Product description

Cembrit Windstopper is a fibre-cement board of type NT according to EN 12467. Cembrit Windstopper Basic boards are CE-marked according to EN 12467 category D, tolerance class I. Cembrit Windstopper Extreme boards are CE-marked according to EN 12467 category A1 and tolerance class I.

The boards are part of a wind barrier layer system which also includes Cembrit Windstopper Tape, corrosion protected Cembrit screws for wood, Cembrit screws for steel and Cembrit clout nails.

Cembrit Windstopper boards are made from portland-cement and limestone filler reinforced with cellulose and polypropylene fibres. The surface has a light grey colour.

The approval covers Cembrit Windstopper Extreme with nominal thickness 4.5 mm and 9 mm, and Cembrit Windstopper Basic with nominal thickness 9 mm.

Standard width is 1200 mm and standard length 2700 mm. The boards may also be ordered in special dimensions with maximum width 1250 mm and maximum length 3150 mm.

The board surface shall not be treated.

Table 1
Dimensions and tolerances for Cembrit Windstopper boards according to EN 12467

Property	Value	Tolerance	Unit
Lenght	2700	± 5	mm
Width	1200	± 4	mm
Thickness	4.5 / 9	± 13/10	%
Squareness	-	≤ 2	mm/m
Edge straightness	-	≤ 3	mm

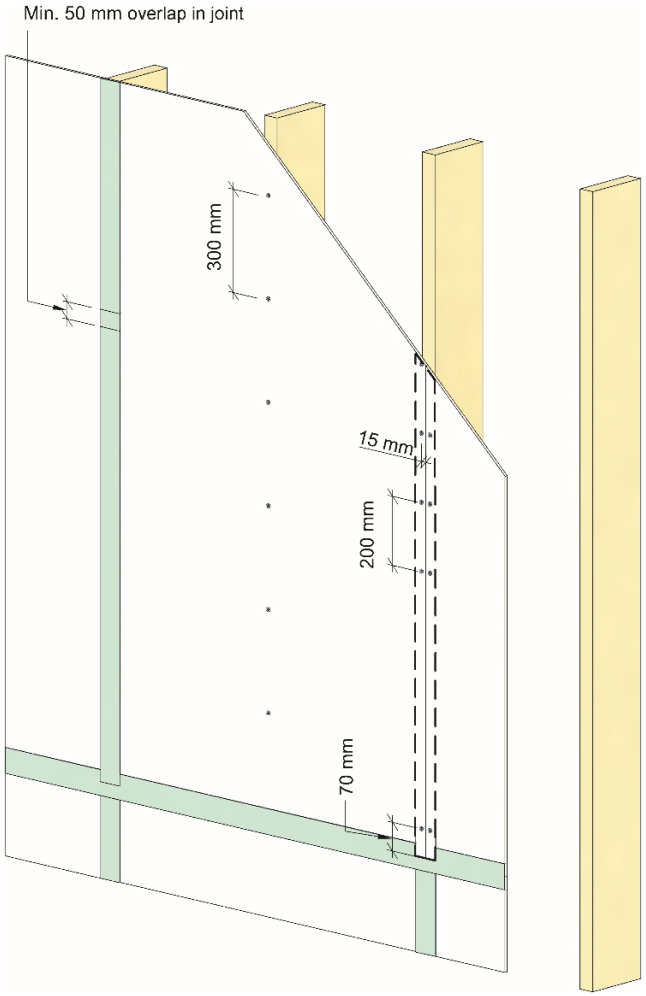

Fig. 1
Cembrit Windstopper installed on timber studs with tape over all joints.

Cembrit Windstopper Tape is a single sided tape and a carrier of polyethylene and protection foil of silicone paper to be used over all joints between boards. The tape is delivered in 50 mm and 75 mm widths. The color is transparent light beige.

Cembrit Windstopper collars are supplied as an accessory, consisting of an EPDM membrane, including tape for sealing small penetrations in the wind barrier layer.

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Table 2
Product properties for Cembrit Windstopper

Property	Test method EN	Cembrit Windstopper Extreme – thickness 4.5 mm		Cembrit Windstopper Extreme – thickness 9 mm		Cembrit Windstopper Basic – thickness 9 mm		Unit
		DoP [1]	Control limit [2]	DoP [1]	Control limit [2]	DoP [1]	Control limit [2]	
Modulus of rupture [3]	12467	≥ 4	≥ 4	≥ 4	≥ 4	≥ 7	≥ 7	N/mm^2
Air tightness Material [3]	12114	-	≤ 0.03	-	≤ 0.03	-	≤ 0.03	m^3/m^2h50Pa
Air tightness Construction, with tape over all joints [3]	12114	-	≤ 0.05	-	≤ 0.05	-	≤ 0.05	m^3/m^2h50Pa
Rain tightness Construction, with tape over all joints [3]	1027 (A)	-	Tight at 450 Pa	-	Tight at 1050 Pa	-	Tight at 1050 Pa	Pa
Water vapour resistance s_d-value [2]	ISO 12572 (50/93 % RF 23°C)	-	≤ 0.5	-	≤ 0.5	-	≤ 0.5	m
Water impermeability [3] 20 mm water column for 24 h	12467	Pass [4]	Tight	Pass [4]	Tight	Pass [4]	Tight	-
Durability [3] - Freeze/thaw - Heat/rain - Warm water - Soak/dry	12467	$R_L \geq 0,75$ [5] $R_L \geq 0,75$ [5] $R_L \geq 0,75$ [5] i.r.	Pass	$R_L \geq 0,75$ [5] $R_L \geq 0,75$ [5] $R_L \geq 0,75$ [5] i.r.	Pass	$R_L \geq 0,75$ [5] $R_L \geq 0,75$ [5] $R_L \geq 0,75$ [5] i.r.	Pass	-
Apparent density	12467	≥ 1300	≥ 1300	≥ 1300	≥ 1300	≥ 1300	≥ 1300	kg/m^3

[1] Manufacturers Declaration of Performance, DoP
[2] Control limit shows values, product has to satisfy during internal factory production control and audit testing
[3] Result from initial type testing
[4] Equal to " Tight after 24 h in 20 mm water "
[5] Equal to "pass"

i.r. – not relevant

3. Fields of application

The Cembrit Windstopper system may be used as a wind barrier layer on timber or steel frame walls with external ventilated cladding.

Cembrit Windstopper may also be used as sheathing and wind barrier in floors over crawl space foundations.

Cembrit Windstopper Basic and Extreme may be used in buildings in fire class 1, 2 and 3.

4. Properties

Material properties
Table 2 shows material properties for Cembrit Windstopper boards.

Air Tightness
The airtightness of the wind barrier makes it possible to fulfil any requirements regarding airtightness (n_{50}) given in the building regulations, and in the Norwegian passive house standards, before the vapour barrier is installed.

Load-carrying capacity
The wind barrier board alone cannot be considered to achieve sufficient wind bracing.

Properties related to fire
The wind barrier has a reaction to fire class A2-s1, d0 according to EN 13501-1, installed on a support system of wood, aluminium or steel, with a ventilated air cavity of minimum 40 mm on the back.

The air cavity can be without insulation or insulated with mineral wool of class A1 or A2-s1,d0. In the case of uninsulated cavities, the substrate must have a minimum reaction to fire class A2-s1, d0. The classification applies to mechanically fastened plates with butt joints.

Fire resistance
The fire resistance according to EN 13501-2 for Cembrit Windstopper Basic and Extreme, both with a minimum thickness of 9 mm is $K_2 10$ on all substrates and $K_1 10$, when installed directly on underlays with a density of at least 300 kg/m^3 (without cavity).

The classification $K_1 10$ and $K_2 10$ is also valid for Cembrit Windstopper boards mounted on a steel support system with the cavity filled with minimum 45 mm mineral wool with minimum class A1 and density 16 kg/m^3. Classification equivalent to $K_1 10$ and $K_2 10$ is valid for Cembrit Windstopper boards mounted on wooden support system consisting of wood with minimum class C18 and the cavity filled with minimum 45 mm mineral wool with minimum class A1 and density 16 kg/m^3, or mounted with at least 22 mm air gap on the back. The substrate in the air gap must have a density of at least 300 kg/m^3 or minimum reaction to fire class A2-s1, d0.

Durability
The durability for the Cembrit Windstopper wind barrier system is considered to be satisfactory based on laboratory testing before- and after accelerated artificial climate ageing. The wind barrier system has been exposed for accelerated artificial ageing for 4 weeks in climate simulator according to NT Build 495. The durability for Cembrit Windstopper Tape's adhesion properties to the wind barrier board is determined based on accelerated artificial ageing in climate simulator according to NT Build 495 followed by 24 weeks of heat ageing according to EN 1296.

Local conditions on the site affect the actual climate stress, which in turn depends on the amount of driving rain. Experience shows that heavy rain showers and gusts of wind pose a great danger of water intrusion, and damage to the wind barrier system during the construction period. Therefore, it is generally recommended to install exterior cladding as soon as possible after the wind barrier has been installed.

In places with a low driving rain load (less than 200 mm of driving rain per year), it is considered that the wind barrier system can be uncovered for up to 12 months before external cladding is installed. It is up to the contractor to assess the driving rain load, and local conditions, in each individual construction project, see also Byggforskserien (SINTEF Building Research Design Guides) 451.031 *Klimadata for dimensjonering av regnpåkjenning* (Climate data for dimensioning of rain stress).

5. Environmental aspects

Substances hazardous to health and environment
The product contains no hazardous substances with priority in quantities that pose any increased risk for human health and environment. Chemicals with priority include CMR, PBT or vPvB substances.

Waste treatment/recycling
The product shall be sorted as concrete, brick, LWA etc. and residual waste on disposal. The product shall be delivered to an authorized waste treatment plant for material and energy recovery.

Environmental declaration
An environmental declaration (EPD) has been worked out according to EN 15804 for Cembrit Windstopper. For complete documentation see EPD nr. MD-21010-EN, www.epddanmark.dk.

6. Special conditions for use and installation

Design considerations
Cembrit Windstopper shall be fixed to a timber frame with minimum 48 mm thick studs, or to steel profiles with minimum 40 mm wide flanges. The boards shall be installed on studs with maximum c/c 600 mm stud spacing.

In the final construction the wind barrier layer shall only be used with an external rain screen as protection.

Installation
The boards are fixed to the wall frame with screws or clout nails spaced 200 mm along the long edges and 300 mm elsewhere. The distance between screws or nails and the board edges shall be minimum 15 mm, and distance to the corners minimum 70 mm, see figure 1. The screw or nail heads shall be level with the board surface.

The diameter of clout nail heads shall be minimum 8 mm. If other types of nails with smaller head are applied the nails shall be covered by a tape in the same way as for joints between boards.

Connections to foundations, window- and door openings, roof and wind barrier penetrations shall follow the principles shown in relevant Building Research Design Guides.

When used as sheathing and wind barrier in floors over crawl space foundations Cembrit Windstopper boards are fixed with screws spaced 200 mm along all edges. The distance between screws and the board edges shall be minimum 15 mm, and distance to the corners minimum 70 mm.

Penetrations of the wind barrier layer in structures with a classified fire resistance shall have a documented fire resistance performance which do not reduce the fire resistance performance of the boards.

In general, it is recommended to cover the wind barrier with an external cladding as soon as possible. However, it is considered that the wind barrier system can remain uncovered, as indicated in clause 4 "Properties", provided that the building is not subjected to large amounts of driving rain. It is also a prerequisite that all joints are protected with tape and that all board edges (for instance along the bottom, sides and top of the wall, and around wall penetrations) are protected against rain.

The wind barrier boards shall be installed according to the recommended principles in Byggforskserien (Building Research Design Guide) No. 523.255 *Bindingsverk av tre. Varmisolering og tetting* (Wooden stud work. Thermal insulation and sealing).

Joint sealing
All joints between boards shall be sealed with Cembrit Windstopper Tape, see figure 1.

The board surface shall be dry and free from dust before the tape is applied.

Minimum effective width shall be 50 mm. At tape joints the overlap shall be minimum 25 mm.

Transport and storage
The boards shall be covered during transportation.

The boards shall be stored on a level support in a dry place.

If stored outside the boards shall be protected from moisture, dirt and mechanical strain by a ventilated tarpaulin.

7. Factory production control

Cembrit Windbarrier boards are produced by Cembrit Production Oy, Lohja, Finland.

The holder of the approval is responsible for the factory production control in order to ensure that Cembrit Windbarrier system is produced in accordance with the preconditions applying to this approval.

The manufacturing of the product(s) and the manufacturer's system for factory production control (FPC) is subject to continuous surveillance in accordance with the contract regarding SINTEF Technical Approval.

Cembrit Holding A/S has a management quality system certified according to ISO 9001:2000 by Bureau Veritas Quality International, certificate no. 8000117.

8. Basis for the approval

The evaluation of Cembrit Windstopper is based on reports owned by the holder of the approval.

9. Marking

The boards are marked with manufacturer, product name, board type and production date. The boards are CE-marked in accordance with EN 12467.

The approval mark for SINTEF Technical Approval TG 20411 may also be used.

10. Liability

The holder/manufacturer has sole product responsibility according to existing law. Claims resulting from the use of the product cannot be brought against SINTEF beyond the provisions of Norwegian Standard NS 8402

for SINTEF

Susanne Skjervø
Approval Manager