

# SINTEF Technical Approval

## TG 20441

SINTEF confirms that

## Hunton wall

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

Hunton Fiber AS  
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2810 Gjøvik  
[www.hunton.no](http://www.hunton.no)

### 2. Product description

#### 2.1 Generelt

Hunton wall is a construction system that is assembled either on site or in the factory by the executive company.

#### 2.2 Scope

The Hunton wall is an external wall construction based on timber framing. The timber framing consists of top and bottom plate of solid wood, and studs of I-beams. The material components like Insulation materials, wind barrier, vapor barrier and internal fibre boards that are approved in the Hunton wall, are listed in table 1.

The approval does not include alternative materials that are needed to complete the wall, such as internal surfaces treatment, windows, and doors. These components must be separately specified in each building project. The approval does not cover control of assembly on construction site, or supplementary building constructions in the specified building project, included technical installations like ventilation systems, electrical systems, or heating systems.

Alternative materials listed in table 2, this material must fulfil the requirements described in TEK and/or the European regulations. In addition, Norwegian requirements for product documentation (DOK) and environmental properties must be fulfilled.

#### 2.3 Construction details

Hunton wall is a traditional wall construction with either horizontal or vertical wooden cladding. Other façade materials can also be used. Positioning of battens and ventilation must follow the principles in the SINTEF Building Research Guide.

- 542.101 Stående trekledning
- 542.102 Liggende trekledning

The core of the construction consists of wind barrier, framework insulation and vapor barrier. Regarding thermal insulation ability of the Hunton wall, the insulation thickness can vary between 200mm to 400mm.

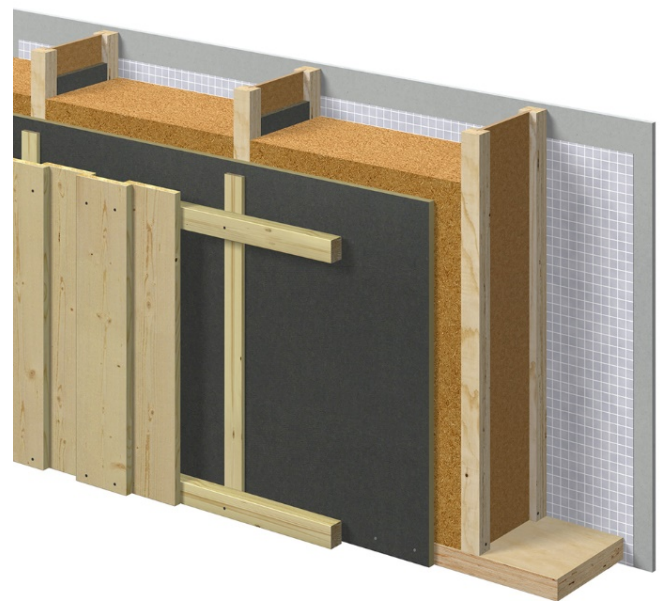


Fig. 1  
Illustration of Hunton wall  
Figure: Hunton Fiber AS

The internal construction of the Hunton wall can be assembled with or without installation layer between the vapor barrier and fibre board. The installation layer can act as an insulation layer for waterpipes and electrical installations. An insulated installation layer will improve the thermal insulation ability of the wall.

### 3. Fields of application

Hunton wall is considered to satisfy pre-accepted conditions for buildings in fire class 1 up to 2 storeys, and residential buildings in (risk class 4) up to 3 stories if each residential unit has direct access to the terrain without having to escape by use of stairs or staircases. For other use, fire safety needs to be documented by a technical consideration regarding fire for each individual project.

### 4. Properties

#### 4.1 Load bearing capacity

Load bearing constructions must be designed for each delivery. Accompanying load bearing components must be designed to fulfil the Eurocodes.

SINTEF is the Norwegian member of European Organisation for Technical Assessment, EOTA, and European Union of Agrément, UEAtc

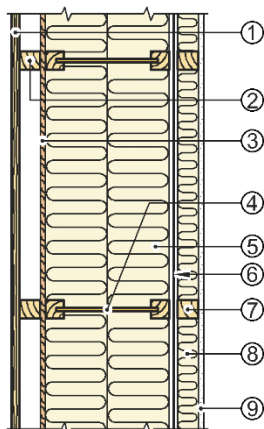


Fig. 2  
Principle design of Hunton wall (horizontal section)

Nr.	Components description
1	19 mm horizontal cladding
2	Battens
3	12 mm Hunton Vindsperre(Hunton Bitroc) Dimensions and fasteners according to table 4.
4	Hunton I-beams"; c/c 600 mm. Type SW 45/"Height acc. to requirements for thermal insulation Flange of LVL 45 x 39 mm; Web of 6,7 mm fiberboard HB.HLA1
5	200 mm Hunton Nativo® Wood fibre insulation.
6	Vapor pro clima INTELLO PLUS
7	48 x 48 mm internal batten
8	50 mm Hunton Nativo® Wood fibre insulation Boards
9	12,5 mm Fermacell gypsum fibre boards Dimensions and fasteners according to table 4.

Table 1.  
Hunton wall. Material specifications for approved products which are included in the Hunton wall

Material / components	Spesification <sup>1)</sup>	TG/PS <sup>2)</sup>	Fire classification <sup>3)</sup>	CE-marking <sup>4)</sup>
<b>Structural component</b>				
Posts and sills	Hunton I-bjelke med LVL R flange	TG 20381	D-s2,d0	
<b>Board materials</b>				
Wind barrier	12 – 25 mm Hunton Vindsperre/ Hunton Bitroc	TG 2002	F	EN 13986
<b>Thermal insulation</b>				
Insulation	Hunton Nativo® Wood fibre insulation Boards with declared conductivity $\lambda_D$ 0,038 W/mK	TG 20440	E	EN 13171
	Hunton Nativo® Wood fibre loose fill insulation with declared conductivity $\lambda_D$ 0,038 W/mK	PS 3397	E	-
<b>Mambranes and sealings</b>				
Vapour barrier	Pro clima INTELLO PLUS	TG 20557	E	ETA 18/1146
	Vapour barriers with valid SINTEF Technical Approval for the intended useages	-	-	-
<b>Claddings and linings</b>				
Internal lining	Fermacell gypsum fibre boards 12,5mm	TG 20122	not documented <sup>5)</sup>	ETA-03/0050

<sup>1)</sup> Unspecified material dimensions must be designed specifically for each individual construction project.

<sup>2)</sup> The components shall be in accordance with the specified SINTEF Technical approval (TG) or SINTEF Product Certificate (PS)

<sup>3)</sup> Fire classification according to EN 13501-1

<sup>4)</sup> The components shall be CE-marked according to the specified standard or ETA

<sup>5)</sup> Fire classification for Fermacell mounted on Hunton Nativo® Wood fibre insulation is not documented.

#### 4.2 Reaction to fire

Fire classification according to EN 13501-1 for products included in Hunton wall are given in table 1. The classification is valid for the current field of this application

#### 4.3 Fire resistance

The fire resistance for Hunton wall, equivalent to classification system in EN 13501-2 is given in table 3. Presumed that the wall is constructed as shown in table 3 and fig.2, and with products as given in table 1 and 2.

Design load capacity for limit state at the specified fire resistance time is given in table 3. Remaining load capacity for the wall with fire resistance REI 30 is given in the table as maximum axial load per meter wall (kN/m with max c/c 600 mm between studs). The load is eccentrically placed at 1/3 of the wall thickness (stud dimension) from internal side.

The fire resistance to the wall with REI 30 with associated load capacity also applies to the following changes:

- Reduction of wall height
- Wall thickness (Posts depth and insulation thickness) increased
- Posts with higher capacity, according to table 2
- I-beams are replaced with solid wood posts with cross section of at least 45 x 200 mm, and capacities at least as good as the Hunton I-beam given in table

#### 4.4 Thermal insulation

The thermal insulation coefficients for the Hunton wall are given in table 5 and calculated for different thicknesses and different constructions. Distance between posts is generally set at c/c 600mm. Wall height set at 2,4m. Amoun of timber around door-windows are included, provided that the window area is approx. 20% of the external wall area of the building. In total amount of timber is assumed to be 15,5%

Table 2

Hunton wall. Specifications of alternative materials that can be used to complete the wall construction.

Material / components	Spesification <sup>1)2)</sup>	CE-marking <sup>3)</sup>
Structural components		
Sills and posts	Strength graded structural timber with class C24, or according to specific structural calculations. Moisture content max. 18 %	EN 14081
	Construction glulam	EN 14080
Insulation materials		
Thermal insulation	Glass woll insulation with declared thermal conductivity $< \lambda_D 0,037$ W/mK	EN 13162
	Rock woll insulation with declared thermal conductivity $< \lambda_D 0,037$ W/mK	EN 13162
Cladding		
External cladding	Min. 19 mm wooden cladding according to. SN/TS 3186.	-
Internal cladding	Plasterboard of different types and thickness	EN 520
	Chipboard	EN 13986
	Fibre board hard	EN 13986
	Fibre board medium hard	EN 13986
	MDF board	EN 13986
	OSB board	EN 13986
	Plywood board	EN 13986
	Solid wooden panel	SN/TS 3183
Fasteners		
Nails and screws	Nails and screws	EN 14592

<sup>1)</sup> Unspecified material dimensions must be designed specifically for each individual construction project

<sup>2)</sup> The components shall be according to Norwegian demand (DOK) to product documentation, the design shall follow the requirements described in TEK17 and environmental properties.

<sup>3)</sup> The components shall be CE-marked according to the specified standard

Table 3

Fire resistance and design load capacity for limit state fire, with products according to table 1

Vapour	Posts	Insulation	Cladding (minimum layers on each side)	Fire resistance <sup>1)</sup> (design load capacity in fire situation kN/m <sup>2</sup> ) <sup>2)</sup>
Hunton Windproof	Hunton I-beams SW 45 H 200	200 mm Hunton Nativo® Wood fibre insulation Boards or loose fill insulation  <i>Alternatively:</i> glass wool- or rock wool-insulation	Internal: 12,5 mm Fermacell gypsum fibre board <i>Alternatively</i> 12,5 mm standard plasterboard Type A External: 19 mm wooden cladding	R 15 <sup>3)</sup> (Full) <sup>4)</sup>
		200 mm Hunton Nativo® Wood fibre insulation Boards or loose fill insulation	Internal: 12,5 mm Fermacell gypsum fibre board External: 19 mm wooden cladding	REI 30 <sup>3)</sup> 15 kN/m <sup>6)</sup>
		200 mm Hunton Nativo® Wood fibre insulation Boards or loose fill insulation	Internal: 12,5 mm Fermacell gypsum fibre board External: 19 mm wooden cladding	REI 30 <sup>5)</sup> 15 kN/m <sup>6)</sup>

<sup>1)</sup> Fire resistance according to EN 13501-2. Separating properties (EI) and load bearing (R) are stated in minutes.

<sup>2)</sup> Max. wall height 3,0 m. Residual capacity in limit state fire.

<sup>3)</sup> The fire resistance applies to fire exposure from the inside of the wall.

<sup>4)</sup> Load capacity (Full) means that there is no charring of the load bearing system because the cladding protects the underlying construction throughout the resistance period. Ultimate limit state or serviceability limit state will then be the design capacity.

<sup>5)</sup> The fire resistance applies to fire exposure from the outside of the wall

<sup>6)</sup> The load capacity applies to eccentric axial load

**4.5 Durability**

Hunton wall satisfies general requirements that SINTEF recommends in terms of climate shell tightness and durability for external wall

**5. Environmental aspects**

*Substances hazardous to health and environment*

The Hunton wall contain 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.

*Effect on indoor environment*

The Hunton wall is not regarded as emitting any particles, gases or radiation that have a perceptible impact on the indoor climate, or to have any significant impact on health.

*Waste treatment/recycling*

The product shall be sorted as wood, metal, gypsum, residual waste, or other appropriate waste fractions on the building/demolition site.

The product shall be delivered to an authorized waste treatment plant for material recovery, energy recovery or disposal.

*Environmental declaration*

No environmental declaration (EPD) has been worked out for the Hunton wall.

**6. Special conditions for use and installation**

*6.1 Structural design*

Load-bearing timber components in the Hunton wall shall be specific calculated for each building project according to NS-EN 1995-1-1 with related national annex NA. Loads shall be assessed according to NS-EN 1991 with related national annexes NA.

The load bearing capacity of the Hunton wall can alternatively be done by following the SINTEF Building Research Guide

- 523.251 Bindingsverk av tre i småhus. Dimensjonering og utførelse.

Strengths and capacities given in SINTEF Technical Approval for the individual products must be used.

Table 4

Accepted cladding boards that provide adequate coverage of Hunton Nativo® Wood fibre insulation.

The cladding must be mounted directly on the insulation without any cavities in between

Material	Product standard EN	Fire classification <sup>1)</sup>	Cladding classification <sup>1)</sup>	Min. material-thickness mm	Min. density kg/m <sup>3</sup>	Comment
<b>Internal cladding products</b>						
Fermacell gypsum fibre board	15283-2	-	K <sub>2</sub> 10	12,5	≥ 1100	Assembly according to the manufacturer instructions
Plasterboard standard (type A)	520	A2-s1,d0 <sup>c</sup>	K <sub>2</sub> 10 <sup>2)</sup>	12,5	≥ 600	Assembly according to the manufacturer instructions
Chipboard (with or without tongue and groove)	13986 312	D-s2,d0	K <sub>2</sub> 10	12	≥ 600	Fasteners with length min. 30 mm distance max. 200 mm
Wood fibre board hard (with or without tongue and groove)	13986 622-2	D-s2,d0	K <sub>2</sub> 10	10	≥ 800	Fasteners with length min. 40 mm distance max. 100 mm
OSB-board (with or without tongue and groove)	13986 300	D-s2,d2	K <sub>2</sub> 10	15	≥ 600	Fasteners with length min. 30 mm distance max. 200 mm
Plywood board (with or without tongue and groove)	13986 636	D-s2,d0	K <sub>2</sub> 10	12	≥ 450	Fasteners with length min. 30 mm distance max. 200 mm
Solid wood panel (with or without tongue and groove)	13986 14915	D-s2,d0	K <sub>2</sub> 10	12	≥ 450	Fasteners with length min. 30 mm distance max. 200 mm
<b>External cladding products</b>						
Hunton Vindsperre / Hunton Bitroc	13986 622-4	F		12	≥ 235	Based on fire resistance test Fasteners according to manufacturer instructions.

<sup>1)</sup> Provided that the boards are produced according to stated standards, with minimum thickness and minimum density as stated, does the boards satisfy these fire classifications and the cladding classes without the need for testing.

<sup>2)</sup> The fire classification must be declared by the manufacturer

**6.2 Safety in case of fire**

For each individual delivery, the required fire resistance according to TEK shall be determined specifically for loadbearing and/or fire separating building part.

The required design load capacity at limit state fire must be controlled towards the capacities given in table 3. The choice of structure is made based on the need for fire resistance.

Products for internal and external surfaces, behind external ventilated claddings, insulation etc. must be used according to pre-accepted performances in the guideline to TEK. Necessary measures to prevent spread of fire along facades must be evaluated for each building project.

Board materials for internal lining shall be installed according to the principles in SINTEF Building Research Guide:

- 543.204 Montering av gips- og trefiberplater på vegger og himlinger.

Penetrations through building units with required fire resistance, and connections to other building units, must be made in a way which do not reduce the fire resistance performance. See SINTEF Building Research Guide:

- 520.342 Branntetting av gjennomføringer.

With use of Hunton Nativo wood fibre insulation, the insulation must be protected with cladding with fire protecting class at least K<sub>2</sub>10 D-s2,d0 on all internal surfaces. The insulation must also be protected in all penetrations and recesses for doors and windows.

**6.3 Design considerations for thermal insulation.**

U-values given in table 5 are including thermal bridge from extra timber around for door and window openings. For structures other than those specified in table 5, U-values must be calculated for each individual project.

Necessary thermal insulation for the building must be determined for each building project so it satisfies requirements regarding energy-loss according to TEK.

When using I-beams with board insulation, Hunton wood fibre boards should normally be used to even out the width difference between the flange and the web, so the board insulation can be cut rectangularly.

**6.4 Installation**

Building, installation details and mounting shall be according to SINTEF Building Research Guide.

**6.5 Transport and storage**

Components in the Hunton wall shall be protected from precipitation under transport and storage with a watertight cover until the modules are protected by a watertight roof.

Table 5  
Heat transmission coefficient (U value), calculated according to EN ISO 6946 for Hunton wall

Core Insulation thickness	Hunton Windsperre/ Hunton Bitroc				Framework		Native wood fibre insulation	Vapor barrier	Installation layer		Fibre board or plasterboard	Thermal insulation coefficient W/(m <sup>2</sup> K)
					Solid wood	I-Beam <sup>1)</sup>			Without	With Hunton Native board insulation		
	12 mm	15 mm	19 mm	25 mm	48 mm	45 mm						
200 mm	X				X		X	X	X		X	0,22
				X		X	X	X		X	X	0,17
220 mm	X				X		X	X	X		X	0,21
				X		X	X	X		X	X	0,16
Recommended Standard thickness 250 mm	X				X		X	X	X		X	0,18
		X			X		X	X	X		X	0,18
			X		X		X	X	X		X	0,18
				X	X		X	X	X		X	0,17
	X					X	X	X	X		X	0,18
		X				X	X	X	X		X	0,18
			X			X	X	X	X		X	0,18
				X		X	X	X	X		X	0,17
	X				X		X	X		X	X	0,16
		X				X		X	X		X	0,16
			X			X		X	X		X	0,15
				X	X		X	X		X	X	0,15
	X					X	X	X		X	X	0,15
		X				X	X	X		X	X	0,15
		X			X	X	X		X	X	0,15	
			X		X	X	X		X	X	0,14	
300 mm	X				X		X	X	X		X	0,16
				X		X	X	X		X	X	0,13
350 mm	X				X		X	X	X		X	0,14
				X		X	X	X		X	X	0,11

<sup>1)</sup> The calculations considers that the web in the I-beams will be filled with 19mm Hunton wood fibre board on both sides to avoid adjustments to the insulation boards.

**7. Factory production control**

Components in the Hunton wall listed in table 1 shall be produced according to SINTEF technical approval or SINTEF product certification.

The holder of the approval is responsible for the factory production control in order to ensure that Hunton wall and accompanying products are produced in accordance with the preconditions applying to this approval.

The manufacturing of Hunton wall is subject to continuous surveillance of the factory production control in accordance with the contract regarding SINTEF Technical Approval.

**8. Basis for the approval**

The evaluation of Hunton wall is based on reports owned by the holder of the approval.

The evaluation of design and technical solutions are based on recommendations given in SINTEF Building Research Design Guides.

**9. Marking**

The approval mark for SINTEF Technical Approval TG 20441 may also be used for descriptions and marketing documents for Hunton wall.

**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



Hans Boye Skogstad  
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