



Technical Approval

SINTEF Building and Infrastructure confirms that

Hunton Undertak / Hunton Sarket

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
 P.O.Box 633
 NO - 2810 Gjøvik
www.hunton.no

2. Product description

Hunton Undertak is bitumen impregnated soft fibreboards intended for use as a combined underlay under discontinuous roofing and breather membrane, see fig. 1. The boards have a special watertight high density bitumen impregnated layer on the top face. The boards also satisfying the performance requirement concerning minimum water vapour permeability applicable for breather membranes.

The product is sold in the Norwegian market with the product name Hunton Undertak. The product is sold in some export markets with the product name Hunton Sarket.

The boards are being delivered in the formats 18mm x 575 mm x 2400 mm and 25mm x 575 mm x 2700 mm (covering area). The boards have tongue and groove on all four sides. Measures and assembling are shown in fig. 2. The weight is approx. 4.8 kg/m² at 18 mm thickness

3. Fields of application

The boards may be used as combined roofing underlay and breather membrane in thermal insulated pitched timber roofs, where the roofing is placed on battens and counterbattens for ventilation and an external drainage.

Combined roofing underlay and breather membrane is in particular applicable for pitched roofs with continuous thermal insulation from the eaves to the ridge, and for roofs with cold attics where insulation in the plane of the roof is to be installed at a later stage. See also SINTEF Building and Infrastructure's design sheet 525.106 *Pitched timber roof with cold attics* and 525.866 *Use of roofing underlay on cold attics*.

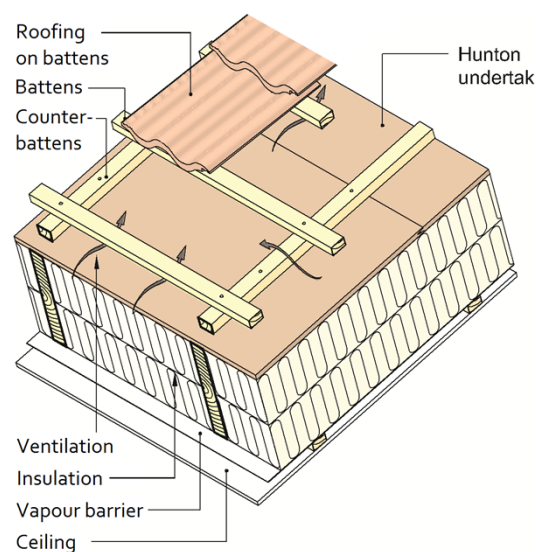


Fig. 1
 Principle design of a roof with Hunton Undertak used as combined roofing underlay and breather membrane. The thermal insulation may be placed directly against the boards. Ventilation of the roof plane is provided between the boards and the roofing.

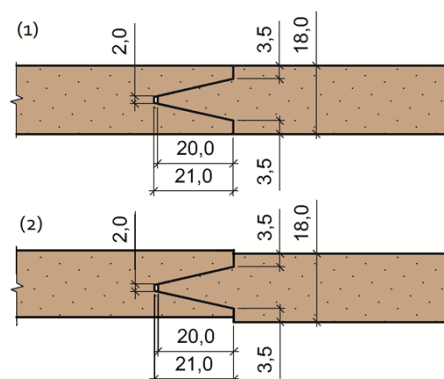


Fig. 2
 Hunton Undertak. Tongue and groove profiles.
 (1) Assembling of the short edges
 (2) Assembling of the long edges with height difference to get better water drainage of the roof underlay

Tabell 1 Material- and construction-properties for Hunton Undertak

Property	Test-method NS-EN (Conditions)	Hunton Undertak thickness [mm]				Unit
		18		25		
		DoP ¹⁾	Control limit ²⁾	DoP ¹⁾	Control limit ²⁾	
Properties related to combined roofing underlay and wind barrier function						
Water tightness (1 kPa)	1928	-	Tight	-	Tight	
Rain tightness Construction ($\geq 18^\circ$)	NT Build 421	-	550	-	550	Pa
Air permeability material	12114	0,4	0,4	0,4	0,4	m ³ /m ² h50Pa
Air permeability construction	12114	-	0,7 ³⁾	-	0,7 ³⁾	m ³ /m ² h50Pa
Water vapour resistance s_d	ISO 12572 (50/93 %RF 23°C)	0,32	0,32	0,42	0,42	m
Thermal-conductivity λ_d	12667	0,05	0,05 ³⁾	0,045	0,045 ³⁾	W/mK
Absorption of condensation water	NT Build 304	-	1,3	-	1,3	kg/m ²
Properties related to structural functions						
Bending strength (vert. to main surface)	310	1,4	1,4	1,1	1,1	N/mm ²
E-modulus bending (vert. to main surface)	310	140	140	120	120	N/mm ²
Racking resistance F_{max} in main surface	594 Anneks A (area 2,4 x 2,4 m) (boards 1,2 x 2,4m)	-	7,35 ⁴⁾	-	7,35 ⁴⁾	kN
Racking resistance R in main surface	594 Anneks A (area 2,4 x 2,4 m) (boards 1,2 x 2,4 m)		228 ⁴⁾		228 ⁴⁾	N/mm
Racking resistance for 2,4m high wall: - with squared edge - with shiplap edge	NT Build 362 (boards 1,2 x 2,4 m)		5)		5)	kN/m
Material related properties						
Moisture movement	318 (30 - 90 % RF)	-	$\leq 0,3$ ³⁾	-	$\leq 0,3$ ³⁾	%
Thickness swelling	317	≤ 6	≤ 6	≤ 6	≤ 6	%

¹⁾ The 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 type testing

⁴⁾ Characteristic values according to NS-EN 14358:2006

⁵⁾ Recommended design-capacity in case of damage by windload evaluated to 3,3 kN/m with squared edges and 2,0 kN/m for grooved edges at a board-thickness of 12mm. Same value can be used on all thicknesses.

4. Properties

General

Product properties and performance are shown in Table 1. The boards are in conformity with the requirements for softboards type SB.HLS according to EN 622-4.

Load carrying capacity

Provided that a sufficient number of not cut plates assembled as described in chapter 7, can Hunton Undertak boards be assumed as good enough bracing in the roof-surface for residential buildings up to two stories.

Properties related to fire

The boards have fire classification class F according to NS-EN 13501-1.

Thermal insulation

Hunton Vindtett's thermal conductivities are shown in table 1 and are giving an advantage to the thermal insulation and can be used in calculation of the thermal transmittance, U-value.

Tread through strength

The boards have not sufficient strength to be treatable during installation.

Durability

Hunton Undertak boards are similar to Hunton Vindtett boards which are assumed to adequate durability as sheathing material in ordinary timber frame buildings.

5. Environmental aspects

Substances hazardous to health and environment

Hunton Undertak 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 residual waste on the building/demolition site. The product shall be delivered to an authorized waste treatment plant for energy recovery.

Environmental declaration

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

6. Special conditions for use and installation

General

Hunton Undertak shall be installed in a way that provides both a watertight and an airtight layer. The application shall follow the principles showed in the SINTEF Building and Infrastructure's design sheet no. 525.102 *Insulated pitched roof with combined roofing underlay and wind barrier*.

The roofing shall be installed as soon as possible after the installation of Hunton Undertak in order to prevent a long period of free exposure to precipitation of the underlay. Thermal insulation, moisture control barrier and ceiling must not be installed before checking that the roofing underlay is properly installed.

Hunton Undertak has limited resistance against exposure of free water for long periods, and shall not be used in places which are particularly exposed to driving rain and snow underneath the roof covering.

Span

Hunton Undertak with thickness 18 mm shall be installed with a maximum span \leq c/c 600 mm. Maximum span for thickness 25 mm is c/c 900 mm

Roof slope

The roof slope shall be minimum 15°.

Transportation and storage

The boards must be dry when they are installed in order to obtain tight joints. Hence the boards must be kept covered from rain and water during transportation and storage until the time of installation.

Installation

The boards are installed with the long side perpendicular to the rafters, and the end joints parallel to the roof slope shall normally be placed over a support. The dark brown, tight bitumen impregnated layer shall be mounted to outwards.

The boards have to be fastened with slate nails, using c/c 100 mm maximum nail spacing along the edges and c/c 250 mm at intermediate supports. Recommended lengths are shown in table 2. Alternatively may corrosion-protected staples be used, provided the staples have a min. wire-diameter of 1.8 mm, a 20 mm long back, and a length of 2,5 times thickness of the board.

Nails and staples must be fixed with the head placed level with the board surface, not penetrating the air tight layer.

The panel joints must be positioned approximately on center of the supports in order to obtain adequate air tightness.

Tabell 2
Recommended nail lengths for different thicknesses

Thickness [mm]	Slate nail dimension [mm]
18	2,8 x 55
25	2,8 x 65

Counterbattens and ventilation

Minimum dimensions of counterbattens have to be used according table 3. Battens have to be used according the installation instructions for the tiles.

Alternative detail at the gutter

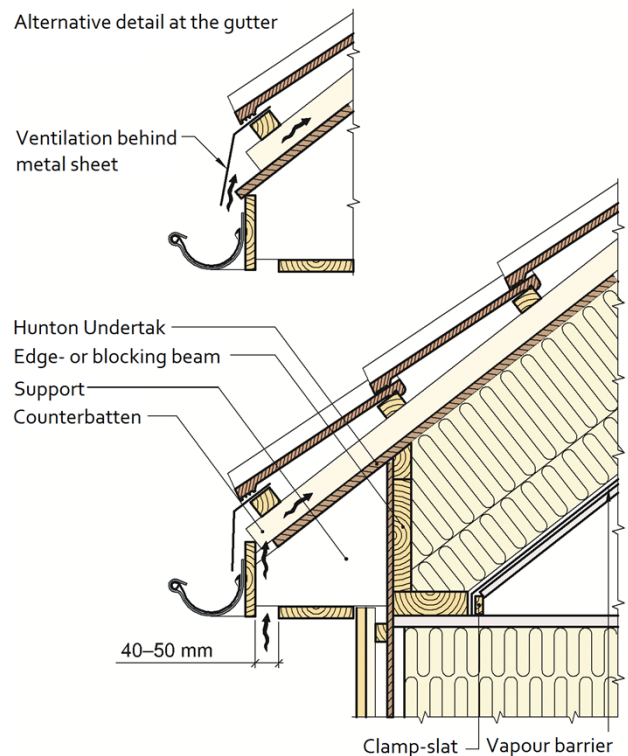


Fig. 3

Example of connection between roof and exterior wall. The joint between the boards and the edge beam or blocking must be airtight, and the boards should be fastened here with max. 100 mm nail spacing.

Table 3. Recommended height of counter battens (mm), depending on roof pitch and roof length.

Roof pitch	Roof length [m] ¹⁾		
	7.5	10	15
18 – 30 °	36	36 + 36	48 + 48 ²⁾
31 – 40 °	30	36	36 + 23
≥ 41 °	23	36	36 + 23

¹⁾ Measured along the pitched roof from eave to ridge
²⁾ For large roof lengths and lower roof pitches it is most practical to use 48 mm counterbattens. Screws have to be used to reach a good pinch between counterbatten and rafter.

Connections and roof penetrations

The combined roofing underlay and breather membrane shall be installed with airtight connections to the breather membrane in exterior walls, and with airtight joints at the ridge and connections between separate roof planes. Also connections at openings in the roof such as roof windows, chimneys etc. must also be made both water- and airtight. Fig. 3 – 6 shows examples of construction details for roofs with Hunton Undertak.

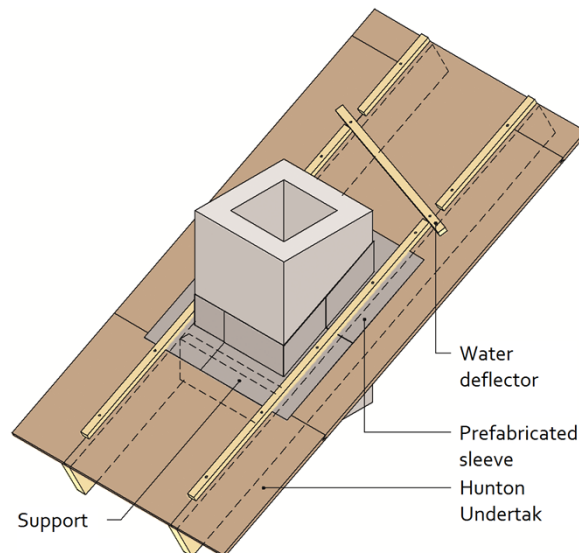


Fig. 6
 Joints at openings in the roof are made tight by the use of prefabricated sleeves which are glued to Hunton Undertak with bituminous glue. Blockings should be used around the opening to provide support for the connection details.

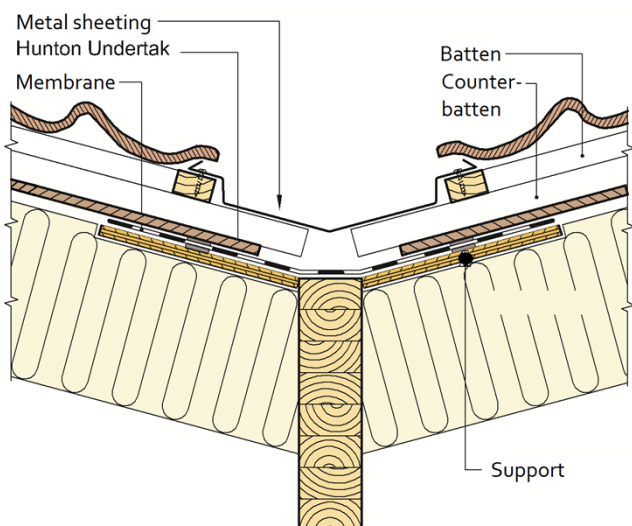


Fig. 4
 A strong watertight membrane is placed on top of valley rafters before Hunton Undertak is installed.

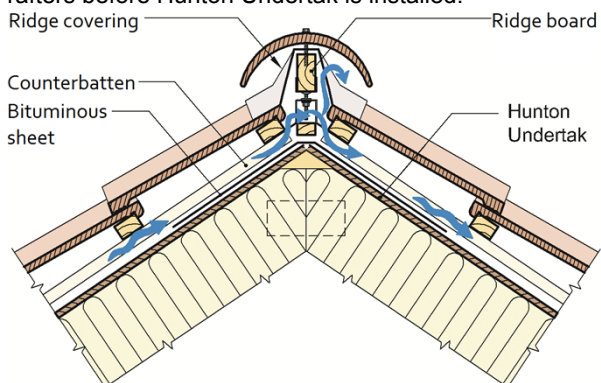


Fig. 5
 Example detail at ridge. The connection between the two roof planes must be airtight. Pads are used under the ridge board in order to provide continuous ventilation across the ridge.

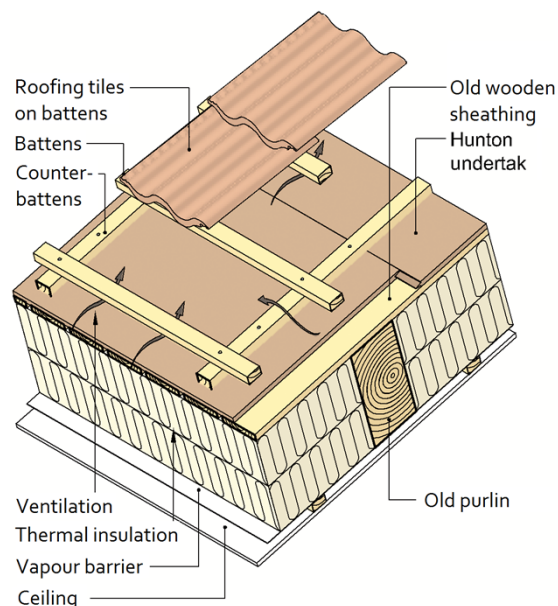


Fig. 7
 Construction principle for use of Hunton Undertak in old roofs where new thermal insulation is installed. The top boards should be removed if the old timber sheathing is board on board. The old sheathing must be made airtight around the perimeter in order to prevent wind from blowing in between the thermal insulation and the new underlay.

The boards may also be applied on top of existing timber board sheathing when old timber roofs are renovated and supplemented with thermal insulation. The insulation may then be installed against the old sheathing as shown in fig. 7 when the old roofing felt is removed first.

Repair of damages

Small damages of the edge profiles may be repaired with bituminous glue in order to make the joints water- and airtight. Broken boards or boards with major edge damages must be replaced.

7. Factory production control

The product is produced by Hunton Fiber AS, 2810 Gjøvik, Norway.

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

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

Hunton Fiber AS, Gjøvik has a quality management system certified by "Det Norske Veritas" according to NS-EN 9001:2008, certificate nr. 18372-2008-AQ-NOR-NA.

8. Basis for the approval

Hunton Undertak is certified according to EN 622-4, see SINTEF Product Certification no. 1019. The approval is otherwise based on type testing and audit testing since 1999 and product properties documented in the following reports:

- Norwegian Building Research Institute. Report no. O 8395B dated 18.09.1998 (water tightness, thickness swelling, water absorption, surface absorption, bending strength)
- Norwegian Building Research Institute. Report no. KO14264 dated 22.09.1998 (U-values)
- Norwegian Building Research Institute. Report no. O 8340-142 dated 13.10.1998 (water vapour resistance)

- Norwegian Building Research Institute. Report no. O 8395C dated 20.10.98 (moisture movement)
- Norwegian Building Research Institute. Report no. O 14361 dated 02.04.2004 (material testing)
- Norwegian Building Research Institute. Report no. O 20796 dated 02.02.2006 (condensation)
- SINTEF Building and Infrastructure. Report no. 3D0304 dated 05.01.2010 (air- and raintightness)
- SINTEF Building and Infrastructure. Report no. 3D113701 dated 01.12.2010 (thermal resistance)
- SINTEF Building and Infrastructure. Report no. 3D113701 dated 11.01.2011 (bending strength)
- SINTEF Building and Infrastructure. Report no. 102010772 dated 21.08.2015 (measuring of properties)

9. Marking

Plates have at least to be marked with their batch number. Wrapping of pallets has to be marked according to NS-EN 13986 and NS-EN 622-4.

The product is CE marked in accordance with EN 13986.

The approval mark for SINTEF Technical Approval No. 2190 may also be used.



Approval mark

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 Building and Infrastructure

Marius Kvalvik

Marius Kvalvik
Approval Manager