NBI Technical Approval

Norwegian Building Research Institute

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Hunton Undertak

is approved by Norwegian Building Research Institute with properties, field of application and conditions as stated in this document.

1. Holder of approval

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2. Manufacturer

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3. Product description

Hunton Undertak (also named Hunton Sarket) is 18 mm thick bitumen impregnated soft fibreboards intended for use as a combined underlay under discontious roofing and breather membrane, see fig. 1. The boards have a special watertight high density bitumen impregnated layer on the top face. However, the boards also satisfy the performance requirement concerning minimum water vapour permeability applicable for breather membranes on the outside of thermal insulation.

Standard board size is 575 mm x 2400 mm (as laid). The boards have tongue and groove as shown in fig. 2 on all four sides. The weight is approx. 4.8 kg/m².

4. Field 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 and the roof has 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.

Hunton Undertak may also be used as sheathing on the underside of suspended timber ground floors. The boards are then delivered in size 545 mm x 2400 mm, with tongue and groove at the short edges only.

5. Properties

General

Product properties and performance are shown in Table 1.

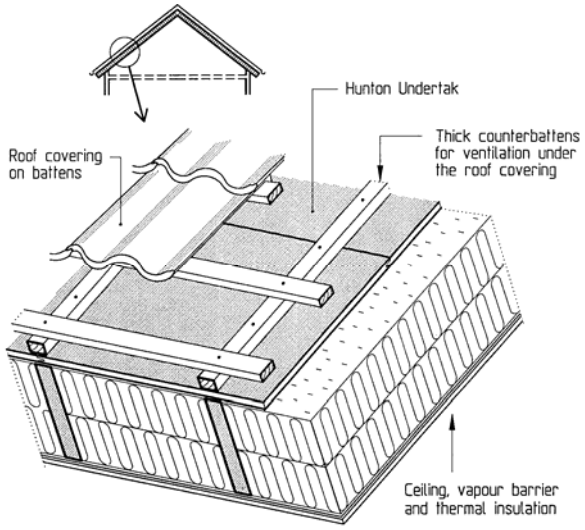

Fig. 1
Principle design of roof construction with Hunton Undertak used as combined roofing underlay and breather membrane. The thermal insulation may be placed directly against the boards. Ventilation of the roof plane is provided between the boards and the roofing.

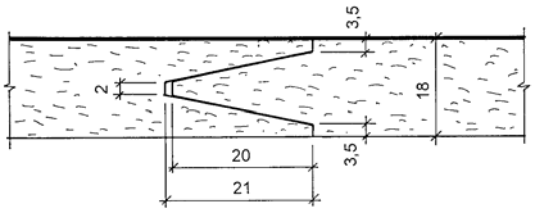

Fig. 2
Hunton Undertak. Tongue and groove profiles.

The boards are in conformity with the requirements for softboards type SB.HLS according to EN 622-4.

Strength

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

Hunton Undertak may be regarded to provide sufficient permanent wind bracing in the plane of the roof for normal lowrise houses.

Table 1
Hunton Undertak. Product properties determined by type testing

	Property	Value	Test method
1	Water tightness, material	Tight at 1kPa	NS 3530
2	Rain resistance	Watertight at 18° slope and 550 Pa pressure diff.	NT Build 421
3	Air tightness, material	0.012 m³/m²hPa	NS 3261
4	Air tightness, construction	0.031 m³/m²hPa	NBI-94
5	Water vapour resistance	$1.82 \cdot 10^9$ m²sPa/kg s_d = 365 mm	ISO/DIS 12752 (50/93 % RH, 20°C)
	Water vapour permeance	$0.55 \cdot 10^{-9}$ kg/(m²·s·Pa)	
6	Moisture movement, parallel transversal	0.29 % 0.32 %	EN 318 (30 – 93 % RH)
7	Thickness swelling 2 h 24 h	2,7 % 10.7 %	EN 317
8	Surface water absorption	50 g/m²	EN 382-2
9	Bending strength *, parallel transversal	1.5 kN/mm² 1.7 kN/mm²	EN 310
10	Thermal resistance	0.36 m²K/W	EN 12667

* Mean values

Reaction to fire

The boards are classified as class F according to EN 13501-1 (no performance determined) and as combustible material according to Norwegian Standard NS 3919.

Thermal insulation

In comparison with thinner roofing underlay materials the use of Hunton Undertak gives approx. 0.,01 W/m²K lower thermal transmittance (U-value) for insulated roof structures with U-values in the range of 0.15 W/m²K.

Durability

The bitumen layer of the boards is identical to the layer used in Asfalt Vindtett sheathing, which by long time experience has proved adequate durability.

Water will penetrate into the joints and cause some swelling in the board material. This effect contributes to the tightness of the joints. However, with regard to durability the boards should not be used where they may be kept continously soaked by water in the finished roof construction.

Environmental declaration

An environmental declaration has been worked out for Hunton Undertak, see reference in clause 8. Table 2 shows a summary.

Table 2
Environmental declaration for Hunton Undertak *

EPD no: 0011		
Has the manufacturer a certified environmental quality management system: No		
Functional unity : m² installed 18 mm fibreboard Service life: 60 years		
Replacements during functional service life		0
Data quality		96 %
Effect on indoor climate	Relevant indoor climate time value	-
	Material classification - CR 1752	-
Chemicals on OBS-list	List A	None
	List B	None
	Other Obs-list	None
	Total mass - gram	0
Environmental impact	Impact index**	0.25
Resources	Recycled materials	5 %
	Renewable materials	70 %
	Not renewable materials	25 %
Waste	Waste material - kg	5.1
	To reuse/ recycling	0 %
	To energy production	88 %
	Waste to deposit	11 %
	Hazardous waste	0 %

* Explanation of method and content of the table is shown in Building Research Design Sheet no. 470.103 Environmental marking and declaration, and no. 470.112 Use of environmental declaration

**Must be used with care when comparing products

Waste treatment/recycling

The product may be sent to ordinary waste deposit after the end of it's working life. The energy content may be regained by combustion.

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 Building Research Design Sheet no. 525.102, with ventilation between the roofing and the underlay.

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 shall be installed with a maximum span ≤ c/c 600 mm.

Roof slope

The roof slope shall be minimum 18°.

Transportation and storage

The boards must be completely 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 boards are fixed with 2.8 – 45 mm cloutnails, placed with 150 mm spacing along the edges and 250 mm spacing at intermediate supports. The nail heads shall be flush with the top surface of the board, without penetrating the watertight layer.

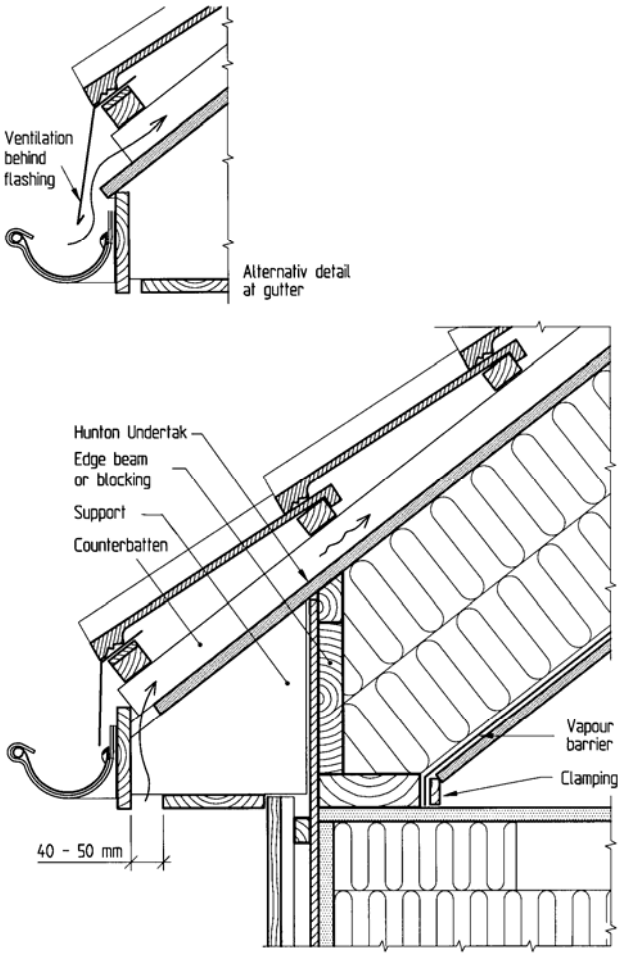

Fig. 3
Example of connection between roof and exterior wall. The joint between the boards and the edge beam or blocking must be airtight, and the boards should be fastened here with max. 100 mm nail spacing.

Roof battens and counterbattens

For roofs with approx. 7 m maximum length between the eaves and the ridge the following mimimum thicknesses of counterbattens shall be used:

Roof slope 18° - 33°:	36 mm
Roof slope 34° - 39°:	30 mm
Roof slope ≥ 40°:	23 mm

For larger roofs the distance between the roof covering and the sarking should be increased.

Connections and roof penetrations

The combined roofing underlay and breather menbrane 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.

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.

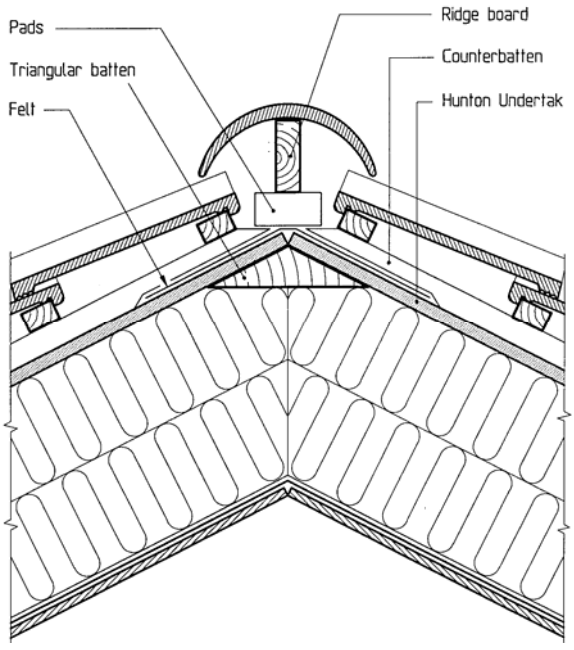

Fig. 4
Example of detail at ridge. The connection between the two roof planes must be airtight. Pads are used under the ridge board in order to provide continuous ventilation across the ridge.

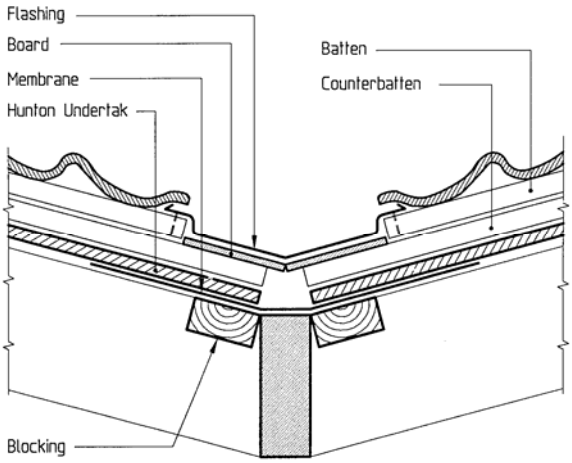

Fig. 5
A strong watertight membrane is placed on top of valley rafters before Hunton Undertak is installed.

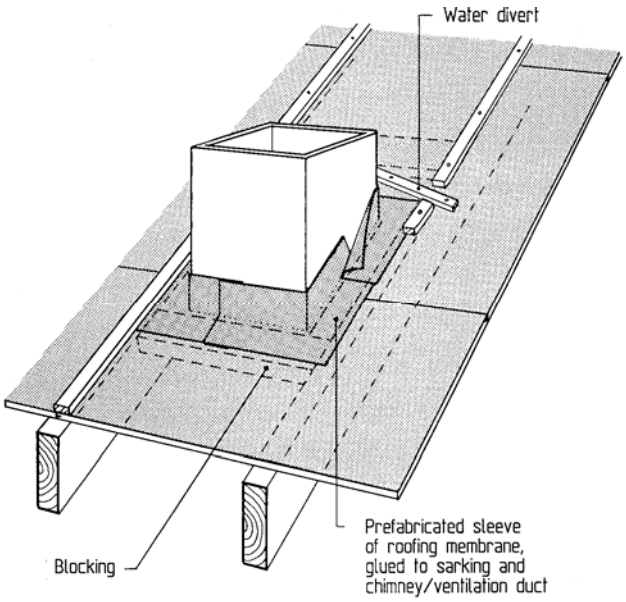

Fig. 6
Joints at openings in the roof are made tight by the use of prefabricated sleeves which are glued to Hunton Undertak with bituminous glue. Blockings should be used around the opening to provide support for the connection details.

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.

Use as floor sheathing

The boards may be applied as sheathing and support for thermal insulation between joists at the underside of suspended ground floors as shown in Building Research Design Sheet no. 522.355 without additional breather membrane. The crawl space must be adequately ventilated and excessive moisture conditions prevented in accordance with the principles shown in Building Research Design Sheet no. 521.203.

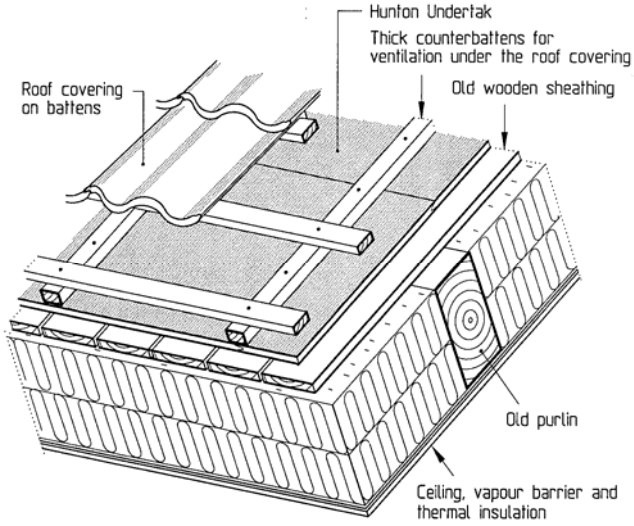

Fig. 7
Construction principle for use of Hunton Undertak in old roofs where new thermal insulation is installed. The top boards should be removed if the old timber sheathing is board on board. The old sheathing must be made airtight around the perimeter in order to prevent wind from blowing in between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

7. Factory production control

The production of Hunton Undertak is subject to supervisory product- and factory production control by contract with Norwegian Building Research Institute. The control includes both regularly inspection of the factory and audit testing of the product.

8. Basis for the approval

Hunton Undertak is certified according to EN 622-4, see NBI Product Certification no. 1019, and the technical approval is based on testing of product properties which are documented in the following reports:

- Norwegian Building Research Institute. Report no. O 8395 datet 17.08.1998 (air- and rain tightness)
- Norwegian Building Research Institute. Report no. O 8395B datet 18.09.1998 (water tightness, thickness swelling, water absorption, surface absorption, bending strength)
- Norwegian Building Research Institute. Report no. KO14264 datet 22.09.1998 (U-values)
- Norwegian Building Research Institute. Report no. O 8340-142 datet 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 datet 02.04.2004 (material testing)
- Norwegian Building Research Institute. Environmental declaration EDP no. 0011 dated 21.06.2004

9. Marking

The boards shall marked according to the provisions in EN 13986 and EN 622-4. NBIs approval mark 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 the NBI beyond the provisions of Norwegian Standard NS 8402.

11. Technical management

Project manager for this approval is Hans Boye Skogstad, Norwegian Building Research Institute, dep. Materials and construction - Trondheim.

Norwegian Building Research Institute

Trond Ø. Ramstad
Head of Approvals