

SINTEF Technical Approval

TG 20571

SINTEF confirms that

RX 6000 combined roofing underlay and wind barrier

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

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2. Product description

RX 6000 combined roofing underlay and wind barrier is a three-layer membrane of thermally bonded non-woven polypropylene fabric, sandwiching a polypropylene microporous film, to achieve a vapour open membrane. The product has integrated adhesive strips. Standard measures and tolerances are given in table 1. Other widths can be supplied if required.

RX 6000 is dark grey and labelled with its name and installation information in white printing.

Table 1
Measures and tolerances for RX 6000

Property	Measure	Tolerance	Unit
Weight per unit	150	±5 %	g/m ²
Width	1.3 / 1.5 / 2.5 / 2.75 / 3.0	+1.5 / -0.5 %	m
Length per roll	50	-0 %	m

Measured according EN 1848-2 and EN 1849-2.

3. Fields of application

RX 6000 can be used as a combined roofing underlay and wind barrier in pitched, thermal insulated, wooden roof constructions with ventilated, discontinuous roofing and external drainage as shown in figure 2. RX 6000 can also be used as a wind barrier in thermal insulated roofs and walls.

Combined roofing underlay and wind barrier is particularly suitable for roofs with continuous thermal insulation from eaves to ridge. RX 6000 may also be installed in pitched wooden roofs with heated rooms in parts of the attic and uninsulated attic spaces.

RX 6000 can be used as combined roof underlayer and wind barrier on roofs in buildings in hazard class 1-6 and fire class 1, 2 and 3 with exception for roofs in fire class 3 where pre-accepted performance states that all components must satisfy minimum class A2-s1,d0.

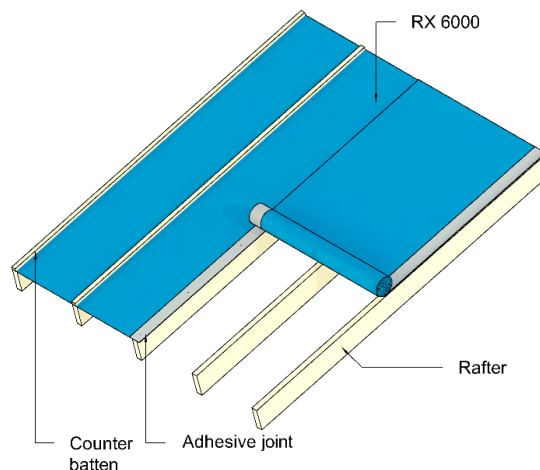


Fig. 1
RX 6000 combined roofing underlay and wind barrier is installed along the rafters

4. Properties

Material properties

Material characteristics for RX 6000 are shown in table 2.

Properties related to fire

RX 6000 has a reaction to fire class E according to EN 13501-1.

Durability

RX 6000 is considered to have satisfactory durability, based on laboratory testing before- and after accelerated artificial climate ageing.

RX 6000 must be protected against direct exposure to UV radiation in the completed construction. The product must be covered as soon as possible after installation on roofs and walls, without unnecessary delay.

Resistance against tread through

Resistance against tread through is not evaluated for RX 6000.

Air tightness construction

The airtightness of RX 6000 makes it possible to fulfil any requirement regarding airtightness (n_{50}) given in the building regulations, and in the Norwegian passive house standards, before the vapour barrier is installed.

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

Table 2

Product characteristics for fresh material of RX 6000 combined roofing underlay and wind barrier

Property	Test method EN	RX 6000		Unit
		Declaration of performance ¹⁾	Control limit ²⁾	
Dimensional stability Longitudinal/Transversal	1107-2	≤ 2	≤ 2.0	%
Water tightness 200 mm water column for 2 hours	1928 / 13859-1	W1	Tight	-
Air tightness material	12114	-	≤ 0.1 ³⁾	m ³ /m ² h50Pa
Air tightness construction	12114	-	≤ 0.2 ³⁾	m ³ /m ² h50Pa
Rain tightness construction	NT Build 421	-	300 ³⁾	Pa
Water vapour resistance <i>s_d</i> -value	ISO 12572	0.03 -0.015/+0.03	≤ 0.06	M
Tear resistance (nail shank) Longitudinal Transversal	12310-1 / 13859-1	180 -20 % 170 -10 %	≥ 144 ≥ 153	N
Tensile strength Longitudinal Transversal	12311-1 / 13859-1	300 -10 % 250 -10 %	≥ 270 ≥ 225	N/50 mm
Elongation at max. load Longitudinal Transversal	12311-1 / 13859-1	40 -0 % 35 -0 %	≥ 40 ≥ 35	N/50 mm
Adhesive strip, Peel resistance Max/Average	12316-2	-	≥ 18/14 ³⁾	N/50 mm
Adhesive strip, Water tightness 200 mm water column for 2 hours	1928 / 13859-1	-	Tight ³⁾	-

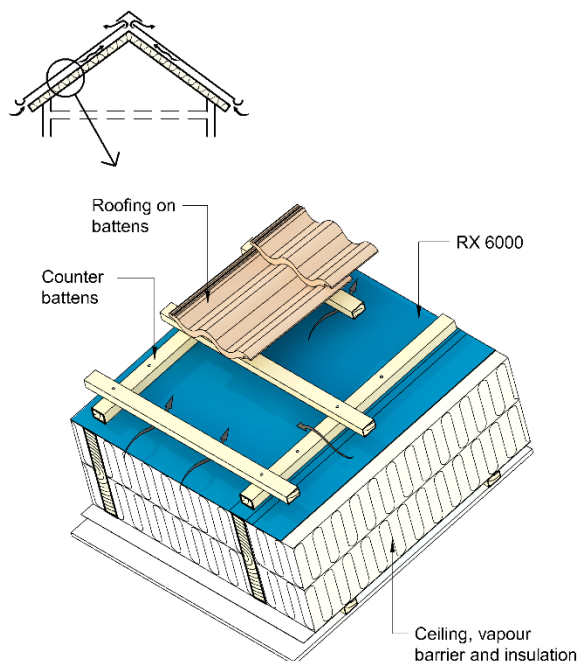
¹⁾ Manufacturers Declaration of Performance, DoP²⁾ Control limit shows values, product has to satisfy during internal factory production control and audit testing³⁾ Result from type testing

Fig. 2

Basic roof construction using RX 6000 as combined roofing underlay and wind barrier

5. Environmental aspects

Substances hazardous to health and environment

RX 6000 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

RX 6000 shall be sorted as plastic waste. The product shall be delivered to an authorized waste treatment plant for energy recycling.

6. Special conditions for use and installation

Design considerations

Combined roofing underlays and wind barriers should generally not be used at very exposed places where experience shows that drifting snow often may accumulate between the roofing and the roofing underlay.

The roofing should be finished as soon as possible after RX 6000 has been installed, to prevent that the wind barrier is freely exposed to weather and/or UV radiation for a longer time. Thermal insulation, vapour barrier and the interior lining shall not be installed before the exterior cladding or roofing has been finished and the underlay is checked.

To avoid reduction of the clamping at the overlaps, due to shrinkage of the wood, the moisture content of the rafters and the battens should be less than 20 % when installing the roofing underlay.

RX 6000 can be used on roofs down to a minimum slope of 10° when the general conditions described in this chapter are followed.

RX 6000 can also be used at roof slopes less than 10° provided that the recommendations in SINTEF Building Research Design Guide no. 525.104 *Slake, luftede tretak med isolerte takflater og utvendig nedløp* are followed. A requirement is that a watertight roofing is used on top of a wooden sheathing. There are also specific requirements for the ventilated gap (height of battens). This solution is not suitable for places that have very little wind or is exposed for snow and rain drift into the ventilated gap. Roofs with low roof slope are vulnerable for leakages if snow or rain drifts into the ventilated gap. Water may penetrate the roofing underlay along screws or nails through the battens. The minimum roof slope is between 1:40 and 3°. The ventilated gap must be constructed with a precipitation chamber to prevent rain and snow drift into the ventilated gap.

Installation

RX 6000 should be installed so that it forms both an airtight and a waterproof layer.

Used at roof slopes above 10° the application shall follow the principles shown in the installation guidelines for RX 6000 and in SINTEF Building Research Design Guide no. 525.101 *Skrå, luftede tretak med isolerte takflater*, 525.106 *Skrå tretak med kaldt loft*, 525.107 *Skrå tretak med oppholdsrom på deler av loftet* and 525.866 *Undertak*.

Used at roof slopes below 10° the application shall follow the principles shown in SINTEF Building Research Design Guide no. 525.104 *Slake, luftede tretak med isolerte takflater og utvendig nedløp*.

RX 6000 is installed parallel to the rafters as shown in figure 1.

The membrane must be installed continuously from eave to ridge without transverse joints, and without battens across the roof pitch. Overlapping joints must be clamped with counter battens on rafters. Used in roof slopes below 10° there must be adhesive strips in the overlapping joints.

Connections to other components and structures

RX 6000 shall be installed with airtight connections to the wind barrier of exterior walls, and with airtight joints at the ridge and valley gutters. In addition, it is important that connections towards roof windows, chimneys etc. are made both water- and airtight, see SINTEF Building Research Design Guide no. 525.101 *Skrå, luftede tretak med isolerte takflater* and 525.866 *Undertak* for details. See also figure 6.

At eaves with protruding rafters the roofing underlay shall be installed around the rafters to get clamped, together with the wind barrier on the wall, to the top sill of the wall. At eaves without protruding rafters, the roofing underlay can be nailed beneath the fold and then sealed to the wind barrier, see figure 3. See also SINTEF Building Research Design Guide no. 525.101 *Skrå, luftede tretak med isolerte takflater* and 525.107 *Skrå tretak med oppholdsrom på deler av loftet*.

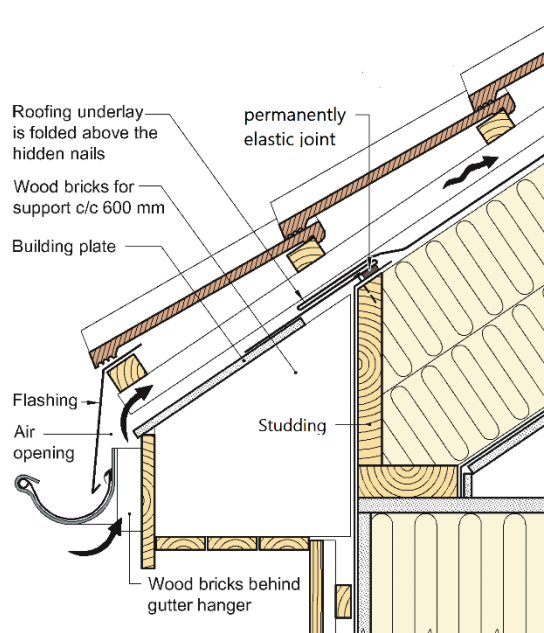


Fig. 3

Example of connection between roof and external wall where the rafters do not protrude the plane of the wall. RX 6000 is folded and positioned over the filler timber, sealed, and clamped together with the wind barrier from the wall. RX 6000 also overlaps the building plate on top of the wood bricks.

Counter battens and ventilation space

Discontinuous roofing shall be ventilated between roofing and the roofing underlay with counter battens and battens. Recommended dimensions depend on the average wind speed at the site, insulation thickness and the length of the ventilated gap, see SINTEF Building Research Design Guide no. 525.101 *Skrå, luftede tretak med isolerte takflater* and 525.104 *Slake, luftede tretak med isolerte takflater og utvendig nedløp* for roof slopes less than 10°.

The counter battens must be mounted in a way that provides tight joints. Using different dimensions to get the desired counter batten height, the lowermost counter batten must not be thicker than 36 mm. The counter battens are screwed with a maximum distance of 300 mm. The minimum length for ribbed nails or screws shall be 2.5 times the battens thickness. The screws are recommended to have no threads on the part that goes through the counter batten.

To reduce the possibility for a leakage through the nail holes a nail sealing tape can be used beneath the counter batten. A nail sealing tape shall be used at roof slopes less than 10°.

Roofs with attics

Even though a combined roofing underlay and wind barrier are best suited for roofs where the vapor barrier can continuously follow the roof plane on the inside, RX 6000 can be used in roofs with heated rooms in parts of the attic, see SINTEF Building Research Design Guide no. 525.107 *Skrå tretak med oppholdsrom på deler av loftet* and in cold, ventilated and non-ventilated attics, see SINTEF Building Research Design Guide no. 525.106 *Skrå tretak med kaldt loft*.

Combination with wooden board sheathing

RX 6000 can be installed directly to wooden board sheathing made of spruce or pine, e.g. in refurbished roofs which are reconstructed and insulated.

The insulation can be placed directly below the wooden board sheathing provided that the total water vapour resistance for the layers does not exceed an s_d -value of 0.5 m. If plywood- or OSB-boards are used, the water vapour resistance must be documented. When rebuilding old roofs, roofing with asphalt roofing must be removed.

If the wooden sheathing is not smooth, an extra batten shall be placed under the regular counter batten to reduce the possibility of leakage. See figure 7.

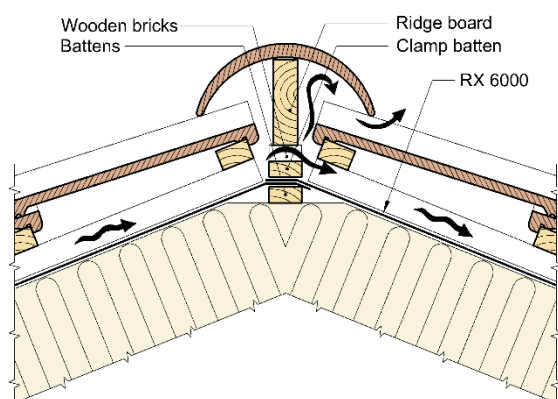


Fig. 4
Example of a ridge. The membranes must be clamped over each other at the top to ensure good airtightness.

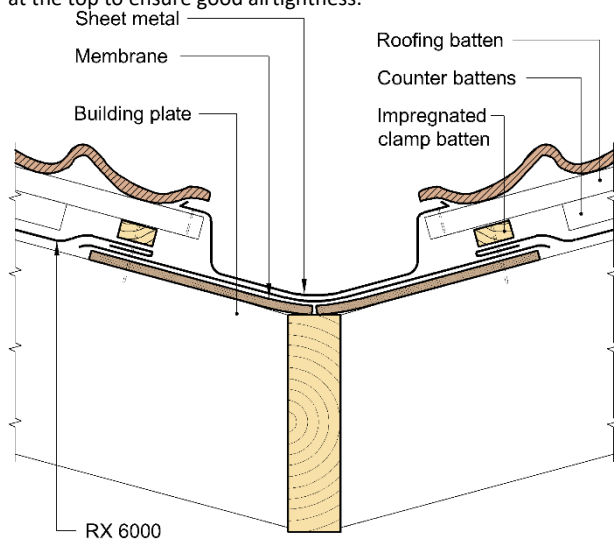


Fig. 5
Example of performance at a valley gutter. The membranes should be clamped over each other at each side of the valley gutter.

Transport and storage

RX 6000 shall be stored under dry conditions on a clean and plane surface protected by wrapping and shielded from direct sunlight.

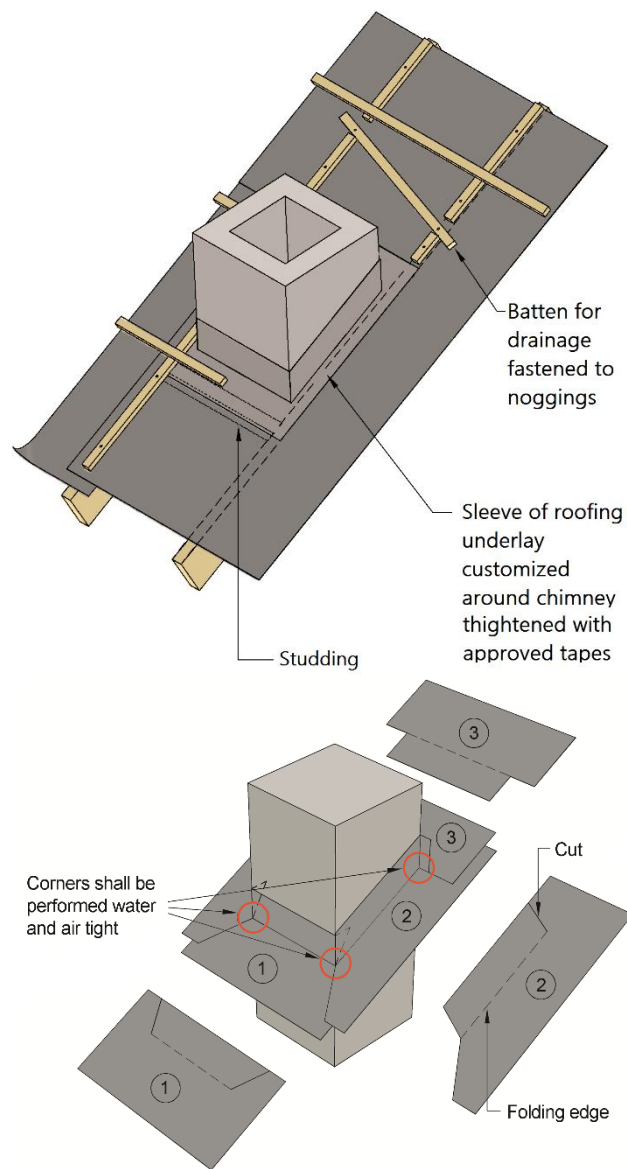


Fig. 6
Example of assembling a chimney sleeve by using RX 6000. The sleeve joints and the connections to the roofing underlay and the chimney shall be sealed with a butyl tape or a butyl based sealing compound.

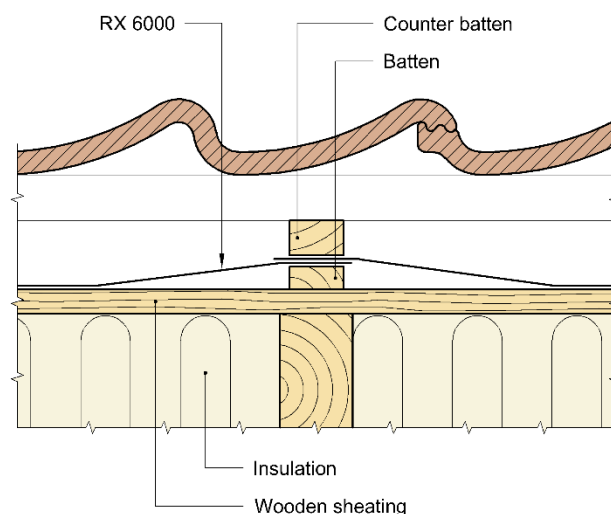


Fig. 7
Example of a transversal joint of RX 6000 on rough wooden sheathing

7. Factory production control

RX 6000 is produced by Masterplast Nyrt., Árpád u. 1/A, 8143 Sárszentmihály, Hungary.

The holder of the approval is responsible for the factory production control to ensure that RX 6000 is produced in accordance with the preconditions applying to this approval.

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

The manufacturer's quality management system is certified according to EN ISO 9001.

8. Basis for the approval

The evaluation of RX 6000 is based on reports owned by the holder of the approval.

9. Marking

Each roll of RX 6000 is marked with the product name, name of the manufacturer and date of manufacturing.

RX 6000 is CE-marked in accordance with EN 13859-1.

The approval mark for SINTEF Technical Approval TG 20571 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