

SINTEF Building and Infrastructure confirms that

Silcartex 180 Double tape 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

Silcart S.p.A.
Via Spercenigo, 5
Mignagola
31030 Carbonera (TV)
ITALY

2. Product description

Silcartex 180 Double Tape combined roofing underlay and wind barrier is made of a diffusion open membrane which is sandwiched between two layers of non woven polypropylene. The weight is $180 \text{ g/m}^2 \pm 5 \%$. The product has a light grey colour on both sides.

Silcartex 180 is delivered on 1.30 m and 1.50 m wide rolls with a length of 50 m. The product has a 65 mm wide taped area on the underside along one of the edges, and a 65 mm wide taped area on the upper side of the opposite edge.

3. Fields of application

The product 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.

Silcartex 180 is used as combined roofing underlay and wind barrier in thermal insulated, pitched wooden roofs with ventilated roofing and external drainage.

The product is particularly suitable for roofs with continuous thermal insulation from eaves to roof ridge, see Fig. 3, but are also suitable for cold, unventilated roofs with thermal insulation in the ceiling. The product can be mounted both parallel with the rafters, see Fig. 1, and perpendicular with the rafters, see Fig. 2.

4. Properties

The airtightness of the wind barrier system 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 mounted.

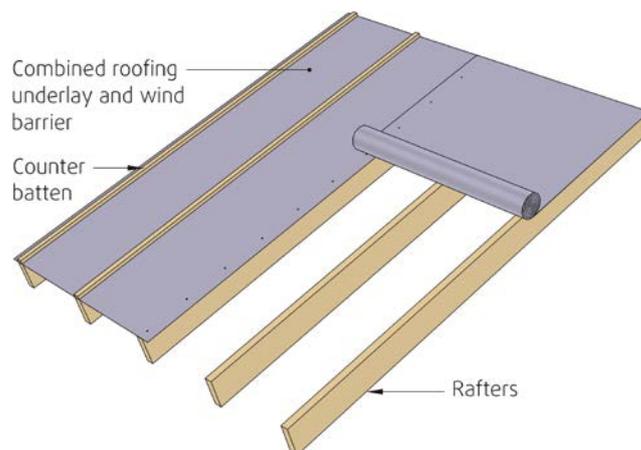


Fig. 1
Silcartex 180 mounted parallel with the rafters.

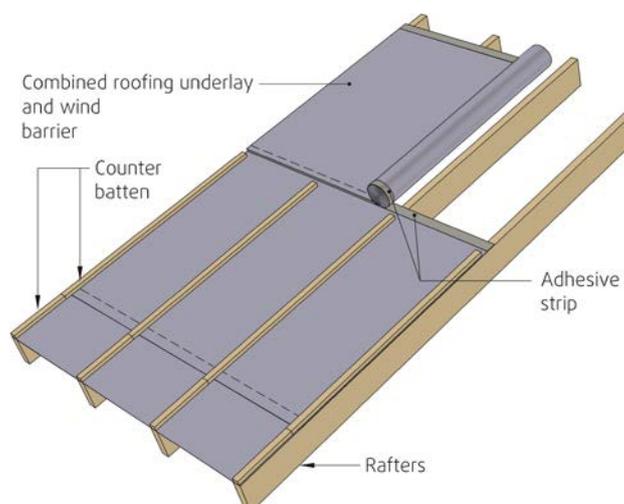


Fig. 2
Silcartex 180 mounted perpendicular to the rafters.

Material properties

The product characteristics are shown in Table 1.

Table 1 Product characteristics

Properties	Testing method	DoP ¹⁾	Control limit ²⁾	Unit
Dimensional stability - Longitudinal - Transversal	EN 1107-2: 2001	-	-0,4 % 0,1 %	%
Water tightness	EN 1928:2000	W1	W1	-
Air tightness, Material ³⁾	12114:2000	-	0,15	m ³ /m ² h50Pa
Air tightness, Construction ³⁾	EN 12114:2000	-	0,10	m ³ /m ² h50Pa
Water vapour resistance	EN ISO 12572 (75 % RH, 23°C)	< 0,03	<0,03	m (s _d value)
Tensile strength - Longitudinal - Transversal	EN 12311-1/ EN13859-1	≥ 330 ≥ 230	≥ 330 ≥ 230	N/50 mm
Elongation at break - Longitudinal - Transversal	EN 12311-1/ EN13859-1	≥ 20 ≥ 20	≥ 20 ≥ 20	%
Tear resistance (nail shank) - Longitudinal - Transversal	EN 12310-1 EN13859-1	≥ 150 ≥ 150	≥ 150 ≥ 150	N
Rain tightness, construction	NT Build421	-	Tight at 15° slope and 600 Pa pressure difference ¹⁾	-

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

Fire properties

Reaction to fire performance for the product has not been determined.

Durability

Silcartex 180 is assessed to have satisfactory durability as long as the product is not exposed to direct sunlight. The durability for both material and joints has been tested by artificial ageing according to EN 13859-1 and NT Build 495 (climate carousel followed by heat ageing).

5. Environmental aspects

Chemicals 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 plastic-based waste. The product shall be delivered to an authorized waste treatment plant for material recovery.

Environmental declaration

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

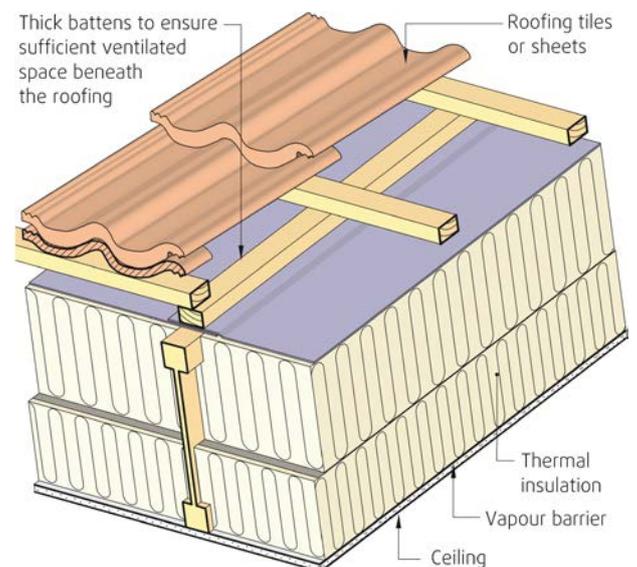


Fig. 3
Principle build-up of a roof construction with combined roofing underlay and wind barrier

6. Special conditions for use and installation

General

The product must be applied so it creates an air- and water tight layer. The usage shall follow the principles showed in Building Research Design Sheet no. 525.102.

Design considerations

Combined roofing underlay and wind barrier should not be used at especially exposed places where experience shows that drifting snow often may be packed between the roofing and the roofing underlay, e.g. valleys and saddle areas.

The roofing should be laid as soon as possible after the product is installed, in order to prevent that the underlay is exposed for a longer period of time. Thermal insulation, vapour barrier and ceiling should not be installed until the roofing has been laid and the underlay is checked to be properly mounted.

The product is recommended for roof with a pitch that equals or exceeds 15°.

Mounting

When mounted parallel with the rafters, Silcartex 180 is mounted continuous from roof ridge to eave with no horizontal joints, see Fig. 1. Use hot dip galvanized felt nails or staples (20 x 2.8, 20 x 2.5 or rapid staples 140/10) to fix the product to the rafters. The product is made sure to be wind- and water tight by creating overlapping joints that are clamped to the rafters with counter battens.

When mounting Silcartex 180 perpendicular to the rafters, the product is mounted continuous from gable to gable, see Fig. 2. The start of mounting shall always start at the eaves. Use hot dip galvanized felt nails or staples (20 x 2.8, 20 x 2.5 or rapid staples 140/10) to fix the product to the rafters. If there are vertical joints, the overlaps must be clamped to the rafters using counter battens.

When mounting Silcartex 180 the taped areas must not be exposed directly to moisture.

In order to minimize the pressure at the overlaps due to shrinkage of the rafters the moisture content of the rafters should be less than 20% when mounting the roofing underlay.

Battens and air ventilation

The roof shall be ventilated above the combined wind barrier and roofing underlay according to Table 2.

Roof angle	Roof length (m) ¹⁾		
	≤ 7,5	10	15
<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 roof ridge to eave

²⁾ For large roofs and low pitched roofs it is most practical to use 48 mm counter battens. These counter battens need to be screwed to achieve good tightness

The counter battens must be mounted so they provide tight joints. It is recommended that the counter battens which are used to clamp overlap joints for the the roofing underlay is not thicker than 36 mm. The counter battens are screwed with a maximum distance of 300 mm. The screws are recommended to have a no threads on the part that goes through the counter batten.

Connections to other components and structures

Silcartex 180 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 penetrations through the roof (chimney, roof windows, canals etc.) are water- and air tight. Fig. 4-6 shows examples of construction details regarding the roofing underlays.

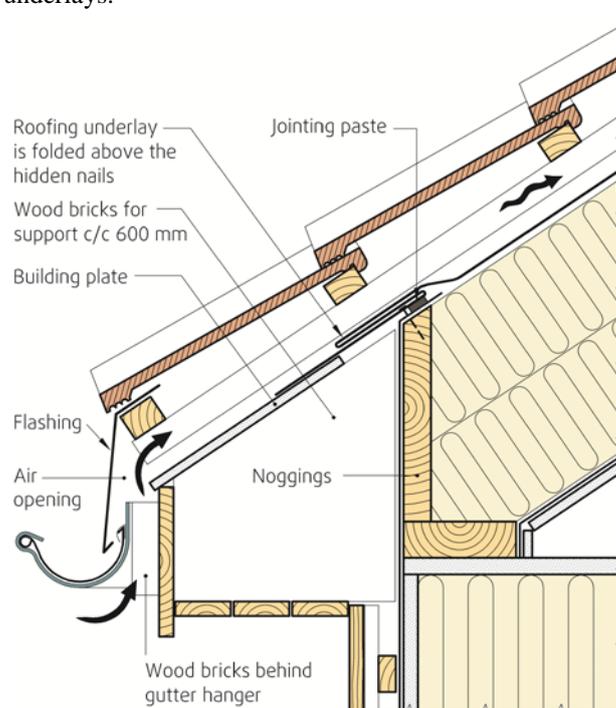


Fig. 4

Example of connection roof construction/external wall.

The rafters stop at the same level as the exterior wall, and the drainage is applied between the flashing and the gutter hangers. Jointing paste is applied between the wind barrier and roofing underlays and clamped to the building plate with short nails with big heads.

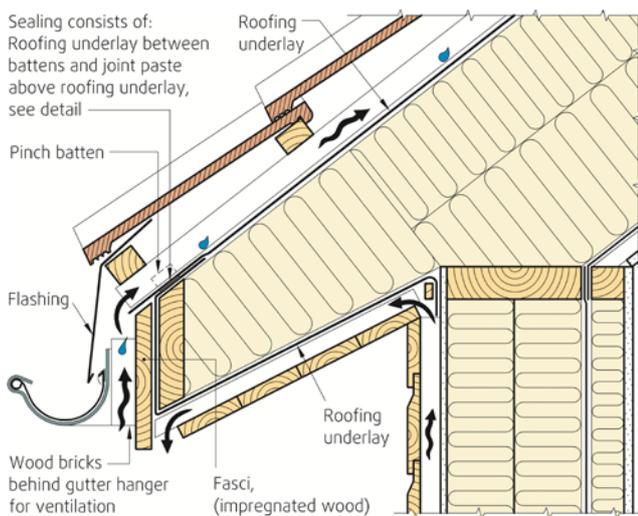


Fig. 5a
 Example of connection roof construction/external wall. The roofing underlay is mounted continuous round the rafters. This increases the possibility of achieving sufficient air tightness.

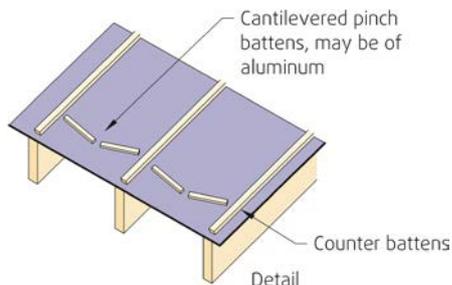


Fig. 5b
 Detail that shows the cantilevered pinched battens that are clamping the roofing underlay to noggings between the rafters. The reason why they are cantilevered is to drain water coming down the roofing underlay.

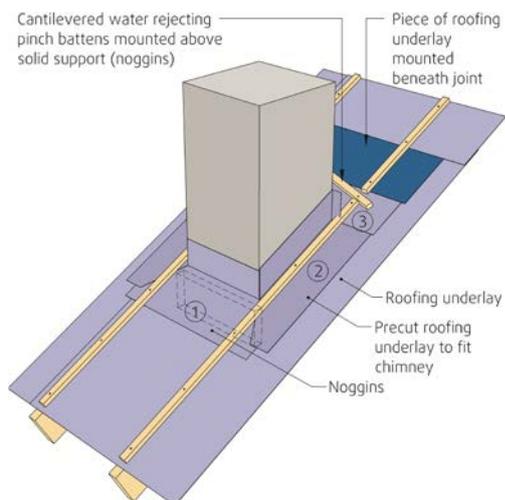


Fig. 6a
 Chimney penetrating the roofing underlay. Sleeves are mounted to ensure water and air tightness. These sleeves are made of Silcartex 180 or prefabricated sleeves recommended by Topit AS. Jointing paste is applied between the chimney and the sleeves. If tape products are used, the tape must be chemical compatible with the roofing underlay.

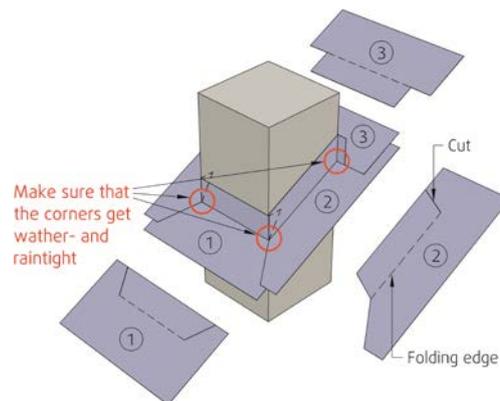


Fig. 6b
 Detail showing the folding and cutting solution around a chimney. Continuous lines are to be cut; discontinuous lines are to be folded. Jointing paste, which is recommended by Topit AS, is applied in all joints.

7. Factory production control

The product is produced by Silcart S.p.A., 31030 Carbonera (TV), Italy.

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.

The quality assurance system at Silcart S.p.A is certified by DNV according to ISO 9001, certificate no. 113901-2012-AQ-ITA-ACCREDIA.

8. Basis for the approval

The technical approval is based on verification of product properties from type testing, documented in the following reports:

- SP. Report 6F 011719B of 2016-10-18 (vanndampmotstand)
- SINTEF Building and Infrastructure. Report 3D1150 of 2012-08-09 (material and construction properties)

9. Marking

Silcartex 180 shall be marked on the packaging with the name of the product, roll dimensions and production code or date.

The product is CE marked in accordance with EN 13859-1.

The approval mark for SINTEF Technical Approval No. 20103 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

A handwritten signature in blue ink that reads "Hans Boye Skogstad".

Hans Boye Skogstad
Approval Manager