

SINTEF Technical Approval

TG 20662

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 Provided listed on
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SINTEF confirms that

Norbit double-layer bitumen roofing membrane

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

Protan AS
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2. Product description

Norbit Top and Norbit Base is a double-layer bituminous roofing membrane of SBS modified bitumen. The bottom layer is mechanically fastened through thermal insulation into the load bearing construction. The top layer is fully bonded to the bottom layer by welding. See figure 1. Measures and tolerances are shown in Table 1.

Norbit Base underlay has a non-woven polyester reinforcement coated with SBS modified bitumen. The upper face has a finish of talcum/sand and the underside is protected by a thermofusible film.

Norbit Top top layer has a reinforcement of composite polyester coated with SBS modified bitumen on both sides. The upper face is coated with slate granulate. The underside is covered with a thermofusible film that melts during welding to the underlay.

Table 1
 Measures and tolerances according to EN 1848-1 and EN 1849-1

Property	Underlay	Top layer	Tolerance
	Norbit Base	Norbit Top	
Thickness	2.9 mm	4.0 mm	
Weight	3.5 kg/m ²	5.0 kg/m ²	+/- 10 %
Width	1 m	1 m	-0/+1 %
Roll length	10 m	8 m	-0/+3 %
Weight of reinforcement	Ca. 150 g/m ²	Ca.170 g/m ²	

3. Fields of application

Norbit Top and Norbit Base double-layer bituminous roofing membrane is used on sloped and flat roofs.

The slope of the roof must be sufficient to allow rain and melting water to drain away. SINTEF Building and Infrastructure recommends a slope of at least 1:40 for all roofs.

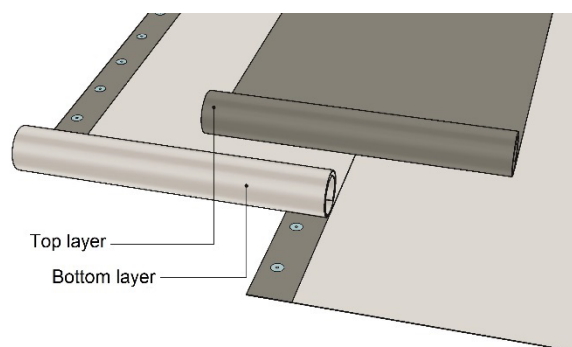


Fig. 1
 Norbit Top and Norbit Base double-layer bituminous roofing membrane.

4. Properties

Product properties

Product properties for fresh material are shown in Table 2.

Safety in case of fire

Norbit Top and Norbit Base double-layer bituminous roofing membrane fulfils the requirements of class BROOF (t2) according to EN 13501-5 on substrates shown in Table 3. The testing is performed according to CEN/TS 1187-2.

Durability

Norbit Top and Norbit Base have shown satisfying properties after artificial ageing.

Calculation of fasteners

The design capacity for different fasteners are shown in Table 4 and applies to the connection between the membrane and the fastener according to EN 16002.

For weak foundations, the connection between the foundation and the fastener might limit the capacity. This must be considered. The lowest value for membrane/ foundation must always be used.

Calculation of fastener spacing is carried out according to SINTEF Building Design Guide 544.206 *Mekanisk feste av asfalttakbelegg og takfolie på flate tak* and "TPF Informs No. 5" published by Takprodusentenes Forskningsgruppe.

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

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 Enterprise register: NO 919 303 808 MVA

Table 2

Product properties for fresh material for products in Norbit Top and Norbit Base double-layer bituminous roofing membrane

Property	Test method EN	Norbit Base		SINTEF's recommended minimum performance ³⁾	Norbit Top		SINTEF's recommended minimum performance ⁴⁾	Unit
		DoP ¹⁾	Control limit ²⁾		DoP ¹⁾	Control limit ²⁾		
Dimensional stability	1107-1	-	0.6	± 0,6	-	0.6	± 0,6	%
Flexibility at low temperature	1109-1	≤ -15	-15	≤ -15	≤ -20	-20	≤ -15	°C
Flow resistance at elevated temperature	1110	-	90	≥ 90	100 -0/+20°C	100	≥ 90	°C
Water tightness 10 kPa/24 h	1928 (A)	Pass	Tight	Tight	Pass	Tight	Tight	-
Adhesion of granules ⁵⁾	12039	-	-	-	-	2.5	≤ 2.5	g
Resistance to tearing (nail shank)	12310-1	150 -0/+50%	150	≥ 150	200 -0/+50%	200	-	N
Tensile strength	12311-1	750 ± 20%	600	≥ 400	850 ± 20%	680	≥ 400	N/50 mm
		550 ± 20%	440	≥ 400	650 ± 20%	520	≥ 400	
Elongation	12311-1	35 ± 15 abs	20	≥ 10	35 ± 15 abs	20	≥ 10	%
		35 ± 15 abs	20	≥ 10	35 ± 15 abs	20	≥ 10	
Average peel resistance of joints	12316-1	≥ 50	50	≥ 50	120 -0/+50%	120	-	N/50 mm
Shear resistance of joints	12317-1	≥ 400	400	≥ 400	600 -0/+50%	600	-	N/50 mm
Resistance to: Impact +23 °C Static loading	12691:2006 (A) 12730:2015 (A)	≥ 500 ≥ 15	500 15	≥ 500 ≥ 15	≥ 1000 ≥ 20	1000 20	≥ 500 ≥ 15	mm. kg

¹⁾ The manufacturers Declaration of performance, DoP²⁾ Control limit shows values the product must satisfy during internal factory production control and audit testing.³⁾ SINTEF's recommended minimum performance in SINTEF Technical Approval for the bottom layer in a double layer system⁴⁾ SINTEF's recommended minimum performance in SINTEF Technical Approval for the top layer in a double layer system⁵⁾ Modified to only give the result of weight loss of granules in gram

Table 3

Norbit Top and Norbit Base double-layer bituminous roofing membrane achieves reaction-to-fire classification class BROOF (t2) on the following substrates

Type of substrate	Norbit Top and Norbit Base double-layer roofing membrane
EPS ²⁾	No
PIR ¹⁾ / ²⁾	Yes
Rock wool	Yes
Wooden sheeting	Yes
Concrete	Yes
Reroofing on old membrane on EPS ²⁾	No
Reroofing on old membrane on PIR ¹⁾ / ²⁾	Yes
Reroofing on old membrane on rock wool	Yes
Reroofing on old membrane on wooden sheeting	Yes
Reroofing on old membrane on concrete	Yes

¹⁾ Fire technical classification for PIR is only valid for PIR-product "Efigreen Acier".²⁾ When roofing on combustible insulation e.g. EPS, XPS or PIR, see *Underlay* in section 6 Special conditions for use and installation regarding replacement of combustible insulation with non-combustible insulation around bushings and adjacent constructions

Table 4

Design capacity for fastening Norbit Top and Norbit Base double-layer bituminous roofing membrane

Fastener type, anchored in min. 120 mm welded overlap	Capacity N/fastener
SFS RP-45 plastic washer with SFS BS-4.8 screw	846 ¹⁾
SFS MW-40-FH plate with SFS IWF-T-B40-5,2x35 screw	769 ¹⁾

¹⁾ Tested according to EN 16002. Design capacity calculated with the safety factor used in Norway; γ_m=1.3

5. Environmental aspects

Substances 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.

Effect on soil, surface water and ground water

The leaching properties of the product are evaluated to have no negative effects on soil or water.

Waste treatment/recycling

The product shall be sorted as residual waste. 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

Substrate

When a fire classification is required the substrate must be in accordance with the provisions stated in section 4 regarding safety in case of fire.

Substrate of combustible insulation as EPS, XPS or PIR must be covered, divided or replaced with non-combustible insulation around bushings and adjacent constructions according to regulations in "Veiledning om tekniske krav til byggverk" § 11-9 and further description in "TPF informerer Nr 6" *Branntekniske konstruksjoner for tak* published by Takprodusentenes Forskningsgruppe, see www.tpf-info.org.

Installation

The underlay shall be mechanically fastened with steel or plastic washers with 100 mm overlaps which are entirely welded over the whole width. Minimum 20 mm bonding on the inside and 30 mm bonding on the outside of the fastener is required.

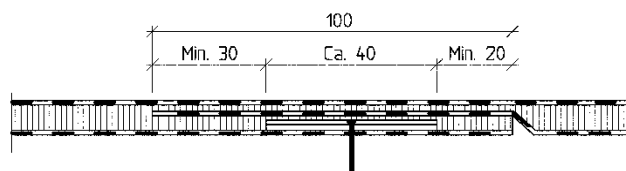


Fig. 2.
Location of mechanical fastener

In places excessively exposed to wind the underlay may in addition be mechanically fastened through the membrane on the outside of the overlap with minimum 100 mm wide strips or patches of Norbit Base over the fasteners as shown in fig. 3.

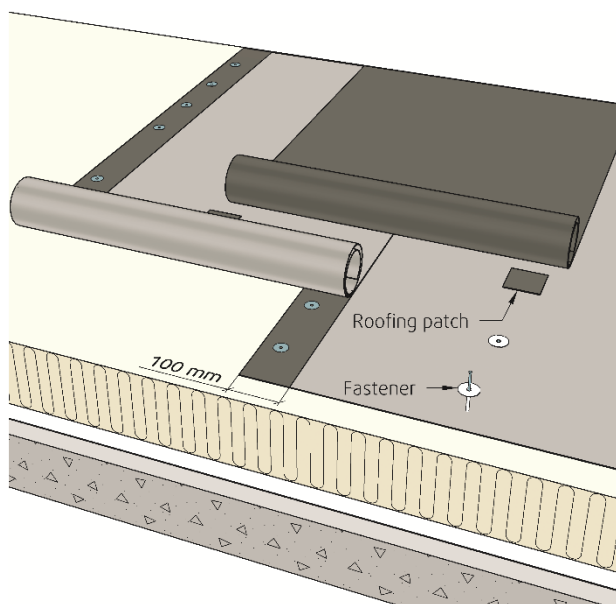


Fig. 3
If necessary, the underlay can be mechanically fastened through the membrane on the outside of the overlap with minimum 100 mm wide strips or patches of Norbit Base over the fasteners.

The top layer shall be installed with shifted overlaps on the underlay and fully bonded to the underlay by welding.

Both the top layer and the underlay transversal joints shall be performed with a 150 mm overlap and the underlying corner shall be chamfered.

The roofing membrane shall otherwise be installed in accordance with the vendor's installation manual and the principles shown in SINTEF Building Design Guide 544.203 *Asfalttakbelegg. Egenskaper og tekking*, 544.204 *Tekking med asfalttakbelegg eller takfolie. Detaljløsninger* and 544.206 *Mekanisk feste av asfalttakbelegg og takfolie på flate tak*, plus "TPF Informerer Nr. 5" published by Takprodusentenes Forskningsgruppe see www.tpf-info.org.

Fasteners

Normal steel washers may be used in longitudinal overlapping joints on firm substrates such as wood-based roof sheathing or concrete.

On substrates of thermal insulation with compressive strength ≥ 80 kN/m² (level CS(10)80 according to EN 13162/13163) steel washers with deep collars or telescopic plastic washers should be used.

Washers with integrated sleeves and good telescopic function must be used for installation on thermal insulation with lower compression strength, and the tightening of the fasteners must be specially checked.

Traffic on the roof

Special precautionary measures should be taken to protect the roofing membrane if the roof is expected to have more traffic than is necessary for inspection and maintenance purposes only.

Transport and storage

Norbit Top and Norbit Base must be stored upright on pallets. The products must be stored dry and tempered in freezing weather.

7. Factory production control

Norbit Top is produced in Belgium and Poland for Protan. Norbit Base is produced in Belgium for Protan.

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.

8. Basis for the approval

The evaluation of Norbit Top and Norbit Base is based on reports owned by the holder of the approval.

9. Marking

All rolls shall be marked with the name of the manufacturer, the product name and the date of the production.

Norbit Top and Norbit Base is CE marked in accordance with EN 13707.

The approval mark for SINTEF Technical Approval No. 20662 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

A handwritten signature in blue ink, reading "Marius Kvalvik". The signature is written in a cursive, flowing style.

Marius Kvalvik
Approval Manager