SINTEF

SINTEF Certification

No. 20545

Technical Approval

Issued first time: 07.10.2016
Revised latest: 28.11.2016
Valid until: 01.01.2022
Provided listed on www.sintefcertification.no

SINTEF Building and Infrastructure confirms that

Singleplan PVC 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

Nordic Waterproofing AB
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www.nordicwaterproofing.com

2. Product description

Singleplan is a roofing membrane made of pliable PVC (polyvinylchloride) with a core of woven polyester. The weight of the core is approx. 100 g/m². Stabilizers have been included to make the PVC-coating resistant to high and low temperatures, ultra violet radiation and making the membrane fire retardant.

Measures and tolerances are shown in Table 1. Standard colour for the upper side is light grey or dark grey.

The product is CE marked in accordance with EN 13956.

3. Fields of application

Singleplan is used as a roofing membrane on sloping and flat roofs. The product is intended for exposed, mechanically fastened roofing, see figure 1.

Roofs must have adequate slope in order to drain water from rain and melting snow. SINTEF Building and Infrastructure recommends in general a minimum slope of 1:40 for all roofs.

Table 1
Measures and tolerances for Singleplan according to EN 1848-2 and EN 1849-2.

Property	Singleplan PVC-roofing membrane	
	1,2 mm	Unit
Thickness Tolerance	1,2 + 0,2 / - 0,1	mm mm
Weight Tolerance	1,5 ± 10	kg/m² %
Width Tolerance	1,06 / 1,50 ± 1	m %
Roll length Tolerance	20 + 5 / - 0	m %

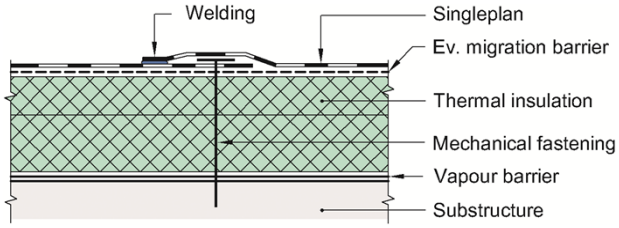

Fig. 1
Singleplan mechanically fastened at overlap joint

4. Properties

Material capacity

The product capacity for new materials are given in Table 3.

Safety in case of fire

Singleplan fulfils the requirements of class B_{ROOF} (t2) according to EN 13501-5 for underlays shown in Table 2. The product has been tested in accordance with CEN/TS 1187-2.

Table 2
Singleplan has class B_{ROOF} (t2) on following underlays:

Type underlay	Singleplan
EPS EPS and ≥ 120 g/m² glass felt	No Yes
Rockwool	Yes
Roof boards of wood	No
Concrete / Silika Plate	Yes
Old coating on EPS Old coating on ≥ 120 g/m² glass felt on EPS	No Yes
Old coating on Rockwool	Yes
Old coating on Roof boards	No
Old coating on concrete / Silika Plate	Yes

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Table 3 Product properties for fresh material of Singleplan PVC roof membrane 1.2 mm

Property	Test method EN	Performance declaration [1]	Control limit [2]	SINTEF's recommended minimum performance [3]	Unit
Foldability at low temperatures	495-5:2001	≤ -30	≤ -30	≤ -30	°C
Dimensional stability	1107-2:2001	-	0,5	0,5	%
Water tightness (10 kPa)	1928:2000	Tight	Tight	Tight	-
Tear resistance	12310-2:2000	≥ 180	≥ 180	≥ 180	N
Tensile strength	12311-2:2000	1250 ± 250	≥ 1000	≥ 600	N/50 mm
Elongation	12311-2:2000	25 ± 10	≥ 15	≥ 10	%
Peel resistance of joints - Average value - Maximum value	12316-2:2000	≥ 200 -	≥ 200 ≥ 300	≥ 150 -	N/50 mm
Shear resistance of joints	12317-2:2000	≥ 1000	≥ 1000	≥ 600	N/50 mm
Water vapour resistance as eqvivalent air-layer thickness;	ISO 12572:2001	-	-	-	s_d- value m
Resistance to puncture - By impact at +23°C - By impact at +23°C - By impact at -10°C - By static load	12691:2006 (A) (hard) 12691:2006 (B) (soft) 12691:2001 (soft) 12730:2001 (C) (soft)	≥ 400 ≥ 400 - ≥ 20	≥ 400 ≥ 400 ≤ 10 ≥ 20	≥ 400 ≥ 400 ≤ 15 ≥ 20	mm mm mm diam. kg

[1] The manufactures Declaration of Performance (DoP).

[2] The stated values are control limits for internal factory production control at the producer and audit testing.

[3] SINTEF's recommended minimum performance in SINTEF Technical Approval for mechanically fastened roofing membranes.

Durability

Product property after artificial ageing according to are given in Table 4. The product have shown satisfying properties after artificial ageing in connection with type-testing and audit testing performed by SINTEF Building and Infrastructure.

Tabell 4
Product property for Singleplan PVC Roof membrane climate aged material according to EN 1297

Property	Test method NS-EN	Control limits	Unit
		1,2 mm	
Foldability at low temperature	495-5:2001	≤ – 25	°C

Calculation of fasteneres

Load capacities for fastening the roofing membrane with various types of fasteneres are shown in Table 5. The capacities relate to the fastening of the membrane itself. The strength of the hold to weak underlay may limit the overall capacity of the fixing points. The lowest value for membrane/underlay must always be used.

Calculation of fastener spacing is carried out according to SINTEF Building Research Design Sheet 544.206 and "TPF Informs No. 5" (www.tpf-info.org).

Table 5
Design capacities at ultimate limit state for Singleplan mechanical fastened with fasteners placed at lane edge

Fastening system/ Fastener	Capacity, N/ per fastener
Guardian RB (P)48	720
SFS Iso-Tak RP48-3N (m/³ fastener with studs)	720

5. Environmental aspects

Substances hazardous to health and environment

Singleplan PVC roof membrane contain no hazardous substances with priority in quantities that pose any risk for human health and environment. Chemicals with priority include CMR, PBT and 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, ground water or drinking water.

Waste treatment/recycling

The product shall be sorted as mixed waste on the building/demolition site. The product shall be delivered to an authorized waste treatment plant for energy recovery or depositing.

Environmental declaration

No environmental declaration (EPD) has been worked out according to EN 15804 for Singleplan.

6. Special conditions for use and installation

Installation

Singleplan is welded by hot air and shall be installed by authorized installer/contractor according to the manufacturer's instructions. The membrane shall otherwise be installed in according to the principles shown in the SINTEF Building Research Design Sheet No. 544.206 and "TPF Informs No. 5 .

Fasteners

Fastening with normal steel washer in longitudinal overlap joints can be used for solid substructures such as wood-based roof sheeting, concrete or old roofing. On thermal insulation with compressive strength ≥ 80 kN/m² (level CS(10)80 according to EN 13162/13163) it is recommended to use plastic washers with sleeve. When the roofing membrane is installed on insulation material with lower compression strength, the tightening of the fasteners must be controlled and fasteners with good telescopic effect must be used.

Design considerations

When a fire classification is required, the underlay must be in accordance with the provision stated in section 5 concerning fire safety.

When the membrane is installed on EPS or EXP insulation, a migration barrier layer of glass felt with minimum 120 g/m² should be used.

When the membrane is installed on asphalt roofing without additional insulation, a separate migration barrier with minimum 150 g/m² shall be used.

Maintenance

In case of repairs, the roofing must be cleaned locally before any welding work is undertaken.

Roof traffic

If growing of traffic is anticipated on the roof, over and above that which is required for inspection and maintenance, special precautions should be taken to protect the roof covering.

Storage

Singleplan PVC roof membrane should be stored on a dry place with the rolls placed on pallets at the building site and protected by a covering.

7. Factory production control

The roof membrane is produced in England for Nordic Waterproofing AB.

The holder of the approval is responible 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.

Nordic Waterproofing AB has a quality system which is certified by Bureau Veritas Certification Sverige AB according to ISO 9001:2008, certificate No. 10000266.

8. Basis for the approval

Material- and design data (fresh and aged) has been verified by type testing and documented in the following reports:

- SINTEF, report 102013457 date 2016.06.27
- SINTEF, report 102013457 date 02.08.2016 (utlekking)
- SGS report date 20. October 2015
- SGS report date 26. August 2015
- SGS report date 2. April 2014.

Resistance against spread of flames is given in Table 2 based on testing according to CEN/TS 1187-2, documented in the following reports:

- SP, Test report 4P07477 date 2014-11-25
- SP, Classification report 4P07477-1 date 2014-11-25.

Attachment in the underlay given in Table 4 is based on wind stress test according to NS-EN 16002, documented in the following reports:

- Constructech, report 20140505-21-3 date 2014-08-21
- Constructech, report 20140505-21-31 date 2014-08-21.

9. Marking

All rolls/ packages shall be marked with the manufacturer's product code, product description and date of the production. The approval mark for SINTEF Technical Approval No. 20545 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

Hans Boye Skogstad

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