

SINTEF Building and Infrastructure confirms that

LOGICROOF V-RP 1,2 – 2,0 mm roofing membranes

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. Manufacturer

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3. Product description

LOGICROOF V-RP is a roofing membrane made of pliable PVC reinforced with a core of woven polyester. Different additives make the roofing membrane resistant to high and low temperatures, ultra violet radiation and other climatic conditions common for roof constructions. LOGICROOF V-RP can be supplied with smooth surface or with anti-slippery surface. Measures and tolerances are shown in table 1.

LOGICROOF V-SR is an accessory product. It is the same material, except that it has no reinforcement.

Table 1

Measures and tolerances for LOGICROOF V-RP and V-SR according EN 1848-2 and EN 1849-2

Description	LOGICROOF V-RP				LOGICROOF V-SR			Tolerance [%]
	1,2	1,5	1,8	2,0	1,5	1,8	2,0	
Thickness [mm]	1,2	1,5	1,8	2,0	1,5	1,8	2,0	+10/-2
Mass per unit [kg/m ²]	1,5	1,7	2,1	2,6	1,4	1,6	2,5	+10/-5
Roll width [m]	2,05				-			+1 /-0,5
Roll length [m]	25	20	15	10	-			+5 /-0
	also by request							
Weight reinforcement [g/m ²]	ca. 100				-			-

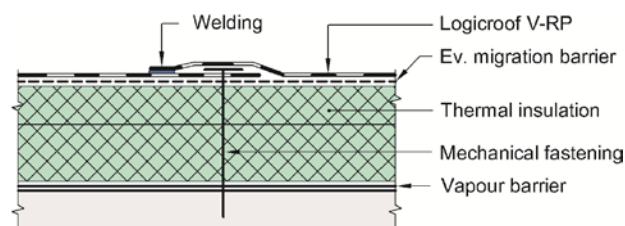


Fig. 1

Example of mechanical fastening of roofing membrane with welded overlap

Both products can be supplied in light and dark grey, white, green, blue and red.

Hot air welding is carried out as sufficient method of installation of LOGICROOF V-RP and LOGICROOF V-SR.

4. Fields of application

LOGICROOF V-RP is used as roofing membrane on sloped and flat roofs. The product is intended for exposed mechanically fastened roofing, see example in fig. 1. The product can also be used for ballasted roof constructions.

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.

LOGICROOF V-SR is used for details with more importance of a better elongation property and flexibility than a very high resistance against tensile forces. For example corners or connections to other kind of materials achieving a waterproof roof construction.

5. Properties

Material properties

Product properties for fresh material are shown in Table 2. Some properties measured after artificial ageing are shown in Table 3

Table 2

Product properties for fresh material of LOGICROOF V-RP and LOGICROOF V-SR according EN 13956

Property	Test method NS EN	DoP ¹⁾	Control limit ²⁾		SINTEFs recommended minimum performance ³⁾	Unit
			V-RP	V-SR		
Foldability at low temperature	495-5 :2013	≤ -35	≤ -35	-40	≤ -30	°C
Dimensional stability	1107-2:2001	-	± 0,3	-	± 0,5	%
Water tightness (10 kPa)	1928:2000 (A)	Pass	Pass	-	Pass	-
Tear resistance	L: T: 12310-2:2000	≥ 180 ≥ 180	≥ 180 ≥ 180	-	180	N
Tensile strength	L: T: 12311-2:2013 (A)	≥ 1100 ≥ 1000	≥ 1100 ≥ 1000	(≥ 15 ⁴⁾ (≥ 15 ⁴⁾)	600	N/50 mm
Elongation	L: T: 12311-2:2013 (A)	≥ 18 ≥ 19	≥ 18 ≥ 19	≥ 350 ≥ 350	10	%
Average peel resistance of joints (T-peel)	12316-2:2013	≥ 300	≥ 300	-	150	N/50 mm
Maximal peel resistance of joints		-	≥ 300	-	-	
Shear resistance of joints	12317-2:2010	-	≥ 600	-	600	N/50 mm
Resistance to puncture	12691:2006 (A) 12691:2001 12730:2001 (A)	≥ 600	≥ 600	-	400	mm
- by impact at +23°C		-	≤ 10	-	15	mm diam.
- by impact at -10°C		-	≥ 20	-	20	kg

¹⁾ The manufacturers Declaration of performance, DoP²⁾ Control limit shows value product has to satisfy during internal factory production control and audit testing³⁾ SINTEFs recommended minimum performance in SINTEF Technical Approval for waterproofing membranes of PVC or TPO⁴⁾ Tensile resistance shown in N/m². Value is equivalent to 1125 N/50mm.

Table 3

Product properties for aged material of LOGICROOF V-RP and LOGICROOF V-SR

Property	Test method NS-EN	Value for both materials	Unit
Foldability at low temperature - aged ¹⁾	495-5	≤ -35	°C

¹⁾ Aged according to method EN 1297 with specimen exposed to 1000 h UV light, heat, water and laboratory climate

Table 4

LOGICROOF V-RP achieves reaction-to-fire classification class B_{ROOF} (t2) on following substrates

Type of substrate	LOGICROOF V-RP
EPS	No
EPS + migration barrier of min. 100 g/m ²	Yes
Rockwool	Yes
Wooden sheeting	No
Wooden sheeting + migration barrier of min. 100 g/m ²	Yes
Concrete	Yes
Reroofing on old membranes on EPS	No
Reroofing on old membrane on EPS + migration barrier of min. 100 g/m ²	Yes
Reroofing on old membrane on rock wool	Yes
Reroofing on old membrane on wooden sheeting	No
Reroofing on old membrane on wooden sheeting + migration barrier of min. 100 g/m ²	Yes
Reroofing on old membrane on concrete	Yes

*Properties related to fire*LOGICROOF V-RP fulfills the requirement for class B_{ROOF} (t2) according to EN 13501-5 for underlays, shown

in table 4. The product has been tested in accordance with CEN/TS 1187-2.

Calculation of fasteners

The capacities for several anchoring materials are given in table 5. These capacities are applying to the connection between the membrane and the fastener according to EN 16002.

Table 5

Design capacities for mechanical fasteners combined with LOGICROOF V-RP

Fastener	Capacity N/piece
SFS Intec Iso-Tak RP48-3NxL fastning plug / BS4,8xL screw	720
Guardian RB-48xL fastning plugg / Guardian BS- 4,8xL screw	720

For weak underlays the connection between the underlay and the fastener might limit the capacity. The lowest value for membrane/underlay must always be used.

Calculation of fastener spacing is carried out according to SINTEF Building Research Design Sheet no. 544.206 and "TPF Informs No. 5".

Durability

The product has shown satisfying properties after artificial ageing in connection with type-testing performed by SINTEF Building and Infrastructure.

6. Environmental aspects*Substances hazardous to health and environment*

LOGICROOF V-RP 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 ground water.

Waste treatment/recycling

The product shall be sorted as residual waste on the building/demolition site. 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 LOGICROOF V-RP.

7. Special conditions for use and installation*Fasteners*

Fastening with ordinary steel washers and screws in longitudinal overlaps may be used on firm underlays such as woodbased sheathing or concrete.

On underlays of thermal insulation with good compression strength, such as expanded polystyrene (EPS) with compression strength of at least 80 kPa/m² (level CS (10) 80 according to EN 13162/13163), steel washers with deep collars or telescopic plastic washers should be used.

Fasteners with good telescopic effect must be used when the membrane is installed on thermal insulation materials with lower compressive strength. The tightening of the fasteners must be specially checked.

Installation

All joints of LOGICROOF V-RP have to be hot air welded, and shall achieve a welded area width of 40mm. The joints shall be installed in accordance with the manufacturer's instructions and in accordance with the principles shown in SINTEF Building Research Design Sheets 544.202, 544.204 and 544.206, as well as information given in "TPF Informs No. 5".

Underlay

When a fire classification is required the underlay must be in accordance with the provisions stated in section 5 "Properties related to fire".

On substrates of EPS, XPS, PUR or old PVC roofing membranes has LOGICROOF to be used together with a migration-barrier of glass-felt with a weight of ca. 100 g/m².

On other substrates, as for example wooden sheeting, old bituminous roofing membrane or concrete has to be used a combined migration- and separation-layer between LOGICROOF V-RP and the substrate. The recommendations of the producer have to be recognized.

Inspections and maintenance

The roofing membranes must be cleaned locally before starting any welding of joints as a part of repair work.

Roof traffic

When it should be expected that roof traffic may exceed what is required for normal inspection visits and maintenance, special measures should be taken to protect the roofing membrane.

Storage

LOGICROOF V-RP has to be stored in a dry place, with the rolls placed on pallets at the building site and protected by wrapping.

8. Factory production control

LOGICROOF V-RP and LOGICROOF V-SR are subject to supervisory factory production and product control according to contract concerning SINTEF Technical Approval

Zavod Logicroof LLC has a quality assurance system certified by ACERT Bureau, St. Petersburg, Russian Federation according to EN ISO 9001, certificate number is Q-49.15.10.

9. Basis for the approval

Material- and design data has been verified by type testing, and are documented in the following reports:

- VTT Finland, report VTT-S-4202-15, dated 14.09.2015, Determination of external fire exposure
- VTT Finland, report VTT-S-4203-15, dated 14.09.2015, Classification of external fire exposure
- SINTEF, report 102008571-3-1, dated 20.07.2015, Type testing of mechanically properties.
- SINTEF, report 102008571-4, dated 05.06.2015, Leaching of chemical substances
- Constructech Sweden, report 20150511-63-1, dated 18.05.2015, Wind-load testing
- Constructech Sweden, report 20150511-63-2, dated 18.05.2015, Wind-load testing
- VTT Finland, report VTT-S-6888-13, dated 04.10.2013, Determination of external fire exposure
- VTT Finland, report VTT-S-6889-13, dated 04.10.2013, Classification of external fire exposure
- VTT Finland, report VTT-S-6028-13, dated 05.09.2013, Determination of external fire exposure

- TT Finland, report VTT-S-6096-13, dated 05.08.2013, Classification of external fire exposure
- BDA KEUR, report 0233-L-11/1, dated 04.02.2012, Wind-load testing
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10. Marking

The product is CE marked in accordance with EN 13956. All rolls shall be marked with the manufacturer's product code, product name and date of production. The approval mark for SINTEF Technical Approval No. 20495 may also be used.



Approval mark

11. 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

12. Technical management

Project manager for this approval is Holger Halstedt, SINTEF Building and Infrastructure, dep. Architecture, Materials and Structures Trondheim

for SINTEF Building and Infrastructure

A handwritten signature in blue ink that reads "Marius Kvalvik".

Marius Kvalvik
Approval Manager