

SINTEF 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

Zavod Logicroof LLC
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<https://en.technicol.eu/>

2. 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, UV 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 stated in table 1.

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

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

Installation of LOGICROOF V-RP and LOGICROOF V-SR is carried out by means of hot air welding.

Table 1
 Measures and tolerances for LOGICROOF V-RP and LOGICROOF V-SR according to 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/-5	
Mass per unit kg/m ²	1.5	1.8	2.3	2.5	2.0	2.3	2.5	←	
	-0/+10 %				-5/10 %				
Roll width m	2.1				1				+1/-0.5
Roll length m	25	20	15	10	10				+5/-0
	also by request								
Weight of reinforcement g/m ²	ca. 100				-				-

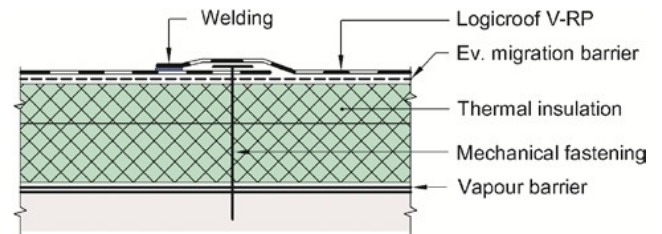


Fig. 1
 Example of mechanical fastening of roofing membrane with welded overlap

3. 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.

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

LOGICROOF V-SR is used for details like corners or connections to other kinds of materials, where properties like elongation and flexibility are more crucial than for instance strength.

4. Properties

Product properties

Product properties for fresh material are shown in Table 2.

Properties related to fire

LOGICROOF V-RP fulfils the requirement of class B_{ROOF} (t2) according to EN 13501-5 regarding external fire performance on substrates shown in table 3. Testing is performed according to CEN/TS 1187, test 2.

Durability

LOGICROOF V-RP has shown satisfying properties after artificial ageing in connection with type-testing and audit testing performed by SINTEF.

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 LOGICROOF V-RP and LOGICROOF V-SR according to EN 13956

Property	LOGICROOF	V-RP 1.2		V-RP 1.5		V-RP 1.8		V-RP 2.0		V-SR 1.5/1.8/2.0		SINTEF's recom. minimum values ³⁾	Unit
	Test method EN	DoP ¹⁾	Control-limit ²⁾	DoP ¹⁾	Control-limit ²⁾	DoP ¹⁾	Control-limit ²⁾	DoP ¹⁾	Control-limit ²⁾	DoP ¹⁾	Control-limit ²⁾		
Foldability at low temperature	495-5	≤ -30	≤ -30	≤ -30	≤ -30	≤ -30	≤ -30	≤ -30	≤ -30	≤ -30	≤ -30	≤ -30 ⁴⁾ ≤ -25 ⁴⁾	°C
Dimensional stability	1107-2	≤ 0.5	± 0.5	≤ 0.5	± 0.5	≤ 0.5	± 0.5	≤ 0.5	± 0.5	≤ 2	-	± 0.5	%
Water tightness (10 kPa/24h)	1928 (A)	-	Pass	-	Pass	-	Pass	-	Pass	-	-	Pass	-
Water tightness (10 kPa/24h)	1928 (B)	Pass	-	Pass	-	Pass	-	Pass	-	Pass	-	-	-
Tear resistance L/T	12310-2	≥ 180	≥ 180	≥ 180	≥ 180	≥ 180	≥ 180	≥ 180	≥ 180		-	≥ 180	N
Tensile strength L T	12311-2 (A)	≥ 1100 ≥ 1000	≥ 1100 ≥ 1000	≥ 1100 ≥ 1000	≥ 1100 ≥ 1000	≥ 1100 ≥ 1000	≥ 1100 ≥ 1000	≥ 1100 ≥ 1000	≥ 1100 ≥ 1000		-	≥ 600	N/50mm
Elongation at max load L/T	12311-2 (A)	≥ 15	≥ 15	≥ 15	≥ 15	≥ 15	≥ 15	≥ 15	≥ 15		-	≥ 10	%
Tensile strength L T	12311-2 (B)	-	-	-	-	-	-	-	-	≥ 16 ≥ 15	≥ 16 ≥ 15	-	N/mm ²
Elongation at max load L/T	12311-2 (B)	-	-	-	-	-	-	-	-	≥ 200	≥ 200	-	%
Peel resistance of joints Average Maximum	12316-2	≥ 300 -	≥ 300 ⁵⁾ ≥ 300 ⁶⁾	≥ 300 -	≥ 300 ⁵⁾ ≥ 300 ⁶⁾	≥ 300 -	≥ 300 ⁵⁾ ≥ 300 ⁶⁾	≥ 300 -	≥ 300 ⁵⁾ ≥ 300 ⁶⁾	≥ 300 -	-	≥ 150 ≥ 200	N/50mm
Shear resistance joints	12317-2	≥ 1000	≥ 1000	≥ 1000	≥ 1000	≥ 1000	≥ 1000	≥ 1000	≥ 1000	≥ 600	-	≥ 600	N/50mm
Resistance to puncture by													
- Impact v/+23°C	12691 (A)	≥ 450	≥ 450	≥ 800	≥ 800	≥ 1000	≥ 1000	≥ 1250	≥ 1250	≥ 600/ ≥ 800/ ≥ 1100	-	≥ 400	mm
- Impact v/ -10°C	12691:2001	-	≤ 10	-	≤ 10	-	≤ 10	-	≤ 10	-	-	≤ 15	mm diam.
- Static load	12730 (A)	-	≥ 20	-	≥ 20	-	≥ 20	-	≥ 20	-	-	≥ 20	kg

¹⁾ The manufacturers Declaration of performance, DoP²⁾ Control limit shows values that the product has to satisfy during internal factory production control and audit testing³⁾ SINTEF's recommended minimum performance in SINTEF Technical Approval for mechanically fastened waterproofing membranes of PVC or TPO⁴⁾ SINTEF's recommended minimum value for membranes with thickness 1.2 mm is -30 °C

SINTEF's recommended minimum value for membranes with thickness ≥1.5 mm is -25 °C

⁵⁾ For failure mode A the average peel resistance has to be assessed towards SINTEF's recommended minimum value for average peel resistance⁶⁾ The control limit applies for failure mode B and C

L = Longitudinal

T = Transversal

Fastening capacity

The design capacity for tested fasteners is given in table 4. The capacity applies to the connection between the membrane and the fastener and is determined in form of a system test according to EN 16002.

For weak substrates the connection between the substrate and the fastener might limit the capacity. This must be considered, and only the lowest capacity for membrane or substrates must always be used.

Calculation of fasteners' spacing is carried out according to SINTEF Building Research Design Guide no. 544.206 and "TPF informer nr. 5" published by Takprodusentenes Forskningsgruppe (TPF), see www.tpf-info.org.

5. Environmental aspects

Substances hazardous to health and environment

LOGICROOF V-RP contains Diantimontrioxid, CAS 1309-64-4 in quantities that pose increased risk for human health and

environment. Diantimontrioxid is a chemical with priority. Chemicals with priority include CMR, PBT and vPvB substances.

Effect on soil, surface water and ground water

The leaching properties of LOGICROOF V-RP are evaluated to have no negative effects on soil or ground water.

Waste treatment/recycling

LOGICROOF V-RP contains Diantimontrioxid and is defined as hazardous waste (according to the Norwegian Waste Regulation (Avfallsforskriften)). The product must be sorted as hazardous waste on the building site, and be delivered to an authorized treatment plant for hazardous waste.

Environmental declaration

No environmental declaration (EPD) has been worked out for LOGICROOF V-RP.

Table 3
LOGICROOF V-RP has fire classification B_{ROOF} (t2) on following substrates

Type of substrate	LOGICROOF V-RP
EPS	No
EPS + migration barrier of min. 100 g/m ² **	Yes
PIR */**	Yes
Stone wool	Yes
Wood particle board	Yes
Concrete / silicate plate	Yes
Reroofing on old membranes on EPS	No
Reroofing on old membrane on EPS + migration barrier of min. 100 g/m ² **	Yes
Reroofing old membrane on PIR */**	Yes
Reroofing on old membrane on stone wool	Yes
Reroofing on old membrane on wood particle board	Yes
Reroofing on old membrane on concrete / silicate plate	Yes

*Fire technical classification on PIR applies only to the tested PIR product "PIR boards F/F TECHNOCOL" with thickness 30 - 200 mm

** In case of roofing on lightweight combustible insulation (e.g EPS, XPS or PIR): See clause 6 *Special conditions for use and installation*, section *Substrate*, regarding requirements for replacement of combustible insulation to non-combustible around passages and against adjacent structures.

Table 4
Design capacities at ultimate limit state for the attachment of LOGICROOF V-RP with different fastening systems

Fastener/Fastening system	Design capacity N/fastener
SFS Intec Iso-Tak RP48-3NxL plastic washer BS4,8xL steel screw (soft substrate, attachment in steel plate)	830 ¹⁾
Guardian RB-48xL plastic washer Guardian BS- 4,8xL steel screw (soft substrate, attachment in steel plate)	830 ¹⁾

¹⁾ Measured according to method EN 16002 and the safety factor used in Norway, $\gamma_m=1.3$

6. Special conditions for use and installation

Installation

All joints of LOGICROOF V-RP must 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 Guide no. 544.202, 544.204 and 544.206, as well as information given in "TPF informer nr. 5".

Fasteners

Normal steel washers may be used in longitudinal overlapping joints on firm substrates such as wood-based 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 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 particularly be checked.

Substrate

When a fire classification is required the substrate must be in accordance with the provisions stated in clause 4 regarding *Properties related to fire*.

Substrates of combustible insulation as EPS, XPS or PIR must be covered or divided, and also 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 informer nr. 6" *Branntekniske konstruksjoner for tak* published by Takproducentenes Forskningsgruppe.

When the membrane is installed on substrates of EPS, XPS, PIR or old PVC roofing membranes, a separate migration barrier of glass felt (minimum 100 g/m²) shall be used.

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

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.

Cleaning and maintenance

Before starting any welding, as a part of repair work, the roofing membrane must be cleaned locally, in accordance with the manufacturer's guidelines.

Transport and storage

LOGICROOF V-RP shall be stored in a dry location, placed on pallets and protected at the building site.

7. Factory production control

LOGICROOF V-RP is produced by Zavod Logicroof LLC, Vostochny Promuzel 21, 390047 Ryazan, Russian Federation.

The holder of the approval is responsible for the factory production control in order to ensure that LOGICROOF V-RP is produced in accordance with the preconditions applying to this approval.

The manufacturing of LOGICROOF V-RP is subject to continuous surveillance of the factory production control in accordance with the contract regarding SINTEF Technical Approval.

Zavod Logicroof LLC has a quality assurance system certified according to EN ISO 9001.

8. Basis for the approval

The evaluation of *LOGICROOF V-RP* is based on reports owned by the holder of the approval.

The evaluation of design and technical solutions are based on recommendations given in SINTEF Building Research Design Guides.

9. Marking

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

LOGICROOF V-RP is CE marked in accordance with EN 13956.

The approval mark for SINTEF Technical Approval No. 20495 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



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