SINTEF

Technical Approval

SINTEF Certification

No. 20657

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Amended:
Valid until: 01.03.2025
Provided listed on www.sintefcertification.no

SINTEF confirms that

Residek N4 5500 WSL

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

Derbigum Norge AS
Breivikbråteveien 9
NO-1555 Son
https://derbigum.no/

2. Product description

Residek N4 5500 WSL single layer roofing membrane is made of SBS modified bitumen with a reinforcement of polyester and glass fibers. On the upper face slate granules are added. The lower face is protected by a thin plastic foil which melts during welding overlapping. Joints can be torched or hot air welded. Measures and tolerances are stated in table 1.

The membrane can be purchased in different colors.

Table 1
Measures and tolerances for Residek N4 5500 WSL according to EN 1848-1 and EN 1849-1

Property	Measure	Unit	Tolerance
Thickness	4.2	mm	± 5 %
Area weight	5.5	kg/m²	± 15 %
Width	1.1	m	+10/-0 mm
Length of roll	7.27	m	+20/-0 mm
Weight of glass fibre core	165	g/m²	± 15 %

3. Fields of application

Residek N4 5500 WSL is used as a single-layer bituminous waterproofing membrane on sloping and flat roofs. The system is specially designed to be used as mechanically fastened single layer roofing, see Fig. 1.

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

4. Properties

Material properties

Product properties for fresh material are shown in table 2.

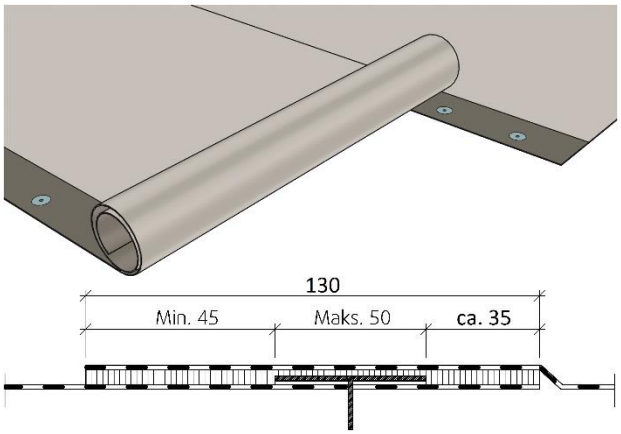

Fig. 1
Residek N4 5500 WSL mechanically fixed in a 130 mm welded side-overlap

Properties related to fire

Residek N4 5500 WSL has a reaction to fire classification B_{ROOF} (t2) according EN 13501-5 on substrates shown in table 3. Testing is performed according to CEN/TS 1187 test 2.

Durability

The products have shown satisfying properties after artificial ageing.

Fastening capacity

The design capacity for tested fasteners is given in table 4. The capacity applies to the connection between the membrane and the fasteners and 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 substrate underlays must always be used.

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Table 2 Product properties for fresh material of Residek N4 5500 WSL

Property	Test method EN	DoP[1)]	Control limits[2)]	SINTEF's recommended minimum performance[3)]	Unit
Dimensional stability	1107-1	-	0.6	≤ ± 0.6	%
Flexibility at low upper face: at low temperature lower face:	1109-1	≤ - 20	- 20	≤ -15	°C
Flow resistance at elevated temperature	1110	-	90	≥ 90	°C
Watertightness 10 kPa/24 h	1928 (A)	Tight	Tight	Tight	-
Adhesion of granules [4)]	12039	-	2.5	≤ 2.5	g[4)]
Resistance to tearing (nail shank) L/T	12310-1	350 ± 30 %	245	≥ 150	N
Tensile strength L: T:	12311-1	800 ± 20 % 750 ± 20 %	640 600	≥ 600	N/50 mm
Elongation L/T:	12311-1	40 ± 15 %	≥ 25	≥ 10	%
Peel resistance of joints, sidelap/endlap - Average - Maximum	12316-1	≥ 100 -	≥ 100 -	≥ 50 -	N/50 mm
Shear resistance of joints, sidelap/endlap	12317-1	≥ 800 ≥ 650	800 650	≥ 600	N/50 mm
Resistance to Impact +23 °C Impact -10 °C Static loading	12691 (A) 12691:2001 12730 (A)	≥ 1000 - 20	1000 30 20	≥ 500 ≤ 30 ≥ 20	mm mm diam. kg
Watertightness after stretching at low temperature (10% elongation at -10 °C)	13897	-	Tight	Tight	-

1) The manufacturers Declaration of performance, DoP.
2) Control limit shows values that the product has to satisfy during internal factory production control and audit testing.
3) SINTEF's recommended minimum performance in SINTEF Technical Approval for single layer bituminous waterproofing.
4) Modified to only give the result of weight loss of granules in gram.
L = Longitudinal T = Transversal

Table 3 Residek N4 5500 WSL has fire classification B_{ROOF} (t2) on following substrates

Type of substrate	Residek N4 5500 WSL
EPS	No
Stone wool	Yes
Wood particle board	Yes
Concrete / silicate plate	Yes
Old roofing membrane on EPS *	Yes
Old roofing membrane on stone wool	Yes
Old roofing membrane on particle board	Yes
Old roofing membrane on concrete or silicate plates	Yes

*) In case of roofing on lightweight combustible insulation (eg EPS, XPS or PIR): See section 6 Condition for use, in section on substrates, on the requirements for replacement of flammable insulation for non-combustible around passages and against adjacent structures.

Calculation of fasteners' spacing is carried out according to SINTEF Building Research Design Guide 544.206 *Mekanisk feste av asfalt takbelegg og takfolie på flate tak* and "TPF informerer nr. 5".

Table 4 Design capacity at ultimate limit state for fastening of Residek N4 5500 WSL.

Fastener/Fastening system	Design capacity N/fastener [1)]
Steel deck substrate, thickness ≥ 0.75mm SFS Isotak Ø 50 mm	923

1) Measured according to method EN 16002 and the safety factor used in Norway γ_m=1.3.

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.

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

Transport and storage

Residek N4 5500 WSL must be stored upright on pallets.

Installation

Mechanical fasteners shall be placed at welded overlaps with a minimum width of 130 mm. The fasteners must be positioned at a distance from the membrane edges that provides ca 35 mm bonding on the inside and minimum

45 mm bonding on the outside of the fastener, see fig. 1. Transverse joints must have a 150 mm overlap. The underlying corner is fastened, and the overlying corner is cut at an angle. A good result is achieved by 'drowning' the surfaces in bitumen before the joint is fully welded.

The roofing membrane shall otherwise be installed in accordance with the vendor's installation manual and the principles shown in SINTEF Building Research Design Guides 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 kPa (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 be checked particularly.

Substrate

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

Substrate 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 informerer nr. 6" *Branntekniske kostruksjoner for tak* published by Takprodusentenes Forskningsgruppe, see www.tpf-info.org.

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.

7. Factory production control

The product is produced by Imperbel SA, B-1360 Perwez, Belgium.

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 manufacturer Imperbel SA-NV has a management quality system certified in accordance with EN ISO 9001.

The manufacturer Imperbel SA-NV has an environmental management system certified in accordance with EN ISO 14001.

8. Basis for the approval

Properties of the product have been determined by initial type testing on fresh and aged material, documented in following reports:

- DBI. Report PCA10538D dated 2019-03-22 (fire)
- SINTEF Community. Report 2019:00057 dated 2019-06-20 (material properties)
- SINTEF Community. Report 2019-00638 dated 2019-06-12 (windload)
- Warrington Fire Agent. Report NO. 18895C dated 12.07.2019 (fire)

9. Marking

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

The product is CE marked in accordance with EN 13707.

The approval mark for SINTEF Technical Approval No. 20657 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

Hans Boye Skogstad
Approval Manager