SINTEF Technical Approval

TG 20657

Issued first time: 04.07.2019
Revised: 23.04.2025
Amended:
Valid until 01.09.2029
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
Kløvningsten 11
NO-1739 Borgenhaugen
www.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. The membrane can be purchased in different colours.

Measures and tolerances are stated in table 1.

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 waterproofing membrane on sloped and flat roofs. The system is specially designed to be used as mechanically fastened single layer roofing, in new buildings or for rehabilitation. 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. Product performance

Product properties
Product properties for fresh material are shown in table 2.

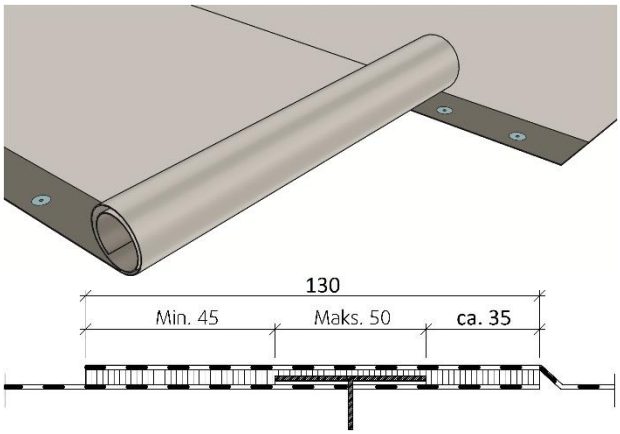

Fig. 1
Residek N4 5500 WSL mechanically fastened with 130 mm welded overlap joint.

Properties related to fire
Residek N4 5500 WSL fulfils the requirements 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.

For more information regarding fire property requirements for the roofing, see TPF Informerer no. 6 *Branntekniske løsninger for kompakte tak og terrasser* published by Takprodusentenes Forskningsgruppe (TPF), see www.tpf-info.org.

Durability
The products have shown satisfying properties after artificial ageing in connection with type-testing and audit testing performed by SINTEF.

Fastening capacity
The design capacity for the fastening of the membrane is given in table 4.

For weak substrates the connection between the substrate and the fastener might limit the capacity. This must be considered.

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 temperature	Surface out Surface in	1109-1	≤ -20	≤ -20	≤ -15	°C
Flow resistance at elevated temperature < 2 mm at tested temp.		1110	-	≥ 90	≥ 90	°C
Watertightness 10 kPa/24 h		1928 (A)	Pass	Passed [5]	Passed	-
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 at max. load	L/T	12311-1	40 ± 15	≥ 25	≥ 10	%
Average peel resistance of joints, Sidelap/Endlap		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 [5] ≥ 20	≥ 500 ≤ 30 ≥ 20	mm mm diam. kg
Watertightness after 10 % elongation at -10 °C		13897	-	Passed [5]	Passed	-

[1] The manufacturers Declaration of performance, DoP.
[2] Control limit shows values that the product must satisfy both 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 give the result of weight loss of granules in gram.
[5] Result from type-testing

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 [1]	No
Mineral wool [1]	Yes
Wood particle board [1]	Yes
Concrete / calcium silicate plate [1]	Yes
Old roofing membrane on EPS [2] [3]	Yes
Old roofing membrane on mineral wool	Yes
Old roofing membrane on wood particle board	Yes
Old roofing membrane on concrete / calcium silicate plates	Yes

[1] Standard substrate according to CEN/TS 1187, test 2.
[2] In case of roofing on combustible insulation:
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.
[3] See clause 6 *Special conditions for use and installation*, section *Substrate*, regarding requirements for the old roofing membrane.

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

Fastener/Fastening system Fastening in 130 mm welded overlap/joint	Design capacity N/fastener
SFS IsoTak R50 plastic washer and SFS BS 4.8 screw Tested on soft substrate, attachment in 0.75 mm steel plate Distance between fasteners: C/C 250 mm Row distance: C/C 970 mm	923 [1]

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

Calculation of fasteners' spacing is carried out according to SINTEF Building Research Design Guide no. 544.206 *Mekanisk innfesting av asfalttakbelegg og takfolie på skrå og flate tak* and TPF informerer nr. 5 *Innfesting av fleksible takbelegg, dimensjonering og utførelse* published by Takprodusentenes Forskningsgruppe (TPF), see www.tpf-info.org.

It is not possible to assume increased wind load capacity by decreasing the distance between the fasteners; due to uncertainty in the type of failure, ref. EAD 030351-00-0402 Annex 1. The lowest capacity for attachment in the membrane / substrate must always be used for the calculation. The fastener capacity can be reduced if the distance between the fastener rows is increased and/or if the difference between the row distance and the fastener distance is increased.

5. Environmental aspects

Substances hazardous to health and environment
Residek N4 5500 WSL 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
Residek N4 5500 WSL 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 Residek N4 5500 WSL.

6. Conditions of use

Installation
Mechanical fasteners shall be placed at welded sidelaps with a minimum width of 130 mm. The fasteners must be positioned at a distance from the membrane edges that provides minimum 35 mm bonding on the inside and minimum 45 mm bonding on the outside of the fastener, see fig. 1.

Transverse joints must have an overlap of minimum 150 mm. The underlying corner is fastened, and the overlying corner is cut at an angle. A good result is achieved by 'drowning' the granules of the surface in bitumen before the joint is fully welded.

Residek N4 5500 WSL can be torched or hot air welded. TPF Informerer no. 6 *Branntekniske løsninger for kompakte tak og terrasser* describes which roofing methods can be used on various roof structures. When roofing with hot air or open flame, all combustible insulation must in principle be protected with non-combustible insulation. However, TPF Informerer no. 6 describes exceptions for hot air welding of roofing membranes with fire class B_{ROOF} (t2).

The roofing membrane shall be installed in accordance with the manufacturer's installation manual and the principles shown in SINTEF Building Research Design Guide no.:

- 544.203 *Asfalttakbelegg. Egenskaper og tekking*
- 544.204 *Tekking med asfalttakbelegg eller takfolie. Detaljløsninger*
- 544.206 *Mekanisk innfesting av asfalttakbelegg og takfolie på skrå og flate tak*
- *525.207 Kompakte tak*

Plus, information sheets issued by Takprodusentenes Forskningsgruppe (TPF), see www.tpf-info.org:

- TPF informerer nr. 5 *Innfesting av fleksible takbelegg, dimensjonering og utførelse*
- TPF informerer nr. 6 *Branntekniske løsninger for kompakte tak og terrasser*
- TPF informerer nr. 13 *Tak under oppføring – forholdsregler og tiltak ved bruk*

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 particularly be checked.

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*.

Substrates of combustible insulation, such as EPS, must be covered or divided into areas, and replaced with non-combustible insulation around bushings and adjacent constructions, such as parapets and walls, according to pre-accepted performances given in the guidance to *Forskrift om tekniske krav til byggverk § 11-9* and in TPF informerer nr. 6 *Branntekniske løsninger for kompakte tak og terrasser*.

In connection with re-roofing, on old bituminous roofing membrane laid on insulation of EPS, the membrane in the old roofing must fulfil the requirements of class B_{ROOF} (t2) according to EN 13501-5 on EPS.

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 vendor's installation manual.

Transport and storage
Residek N4 5500 WSL must be transported in a manner that does not damage the product and stored upright on pallets.

7. Product and factory production control

Residek N4 5500 WSL is produced by IMPERBEL SA, Chaussée de Wavre 67, B-1360 Perwez, Belgium.

The holder of the approval is responsible for the factory production control in order to ensure that Residek N4 5500 WSL is produced in accordance with the preconditions applying to this approval.

The manufacturing of the product and the manufacturer's system for factory production control (FPC) is subject to continuous surveillance in accordance with the contract regarding SINTEF Technical Approval.

The manufacturer IMPERBEL SA has a quality management system certified in accordance with EN ISO 9001 and an environmental management system certified in accordance with EN ISO 14001.

8. Basis for the approval

The evaluation of Residek N4 5500 WSL 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

Residek N4 5500 WSL are marked on their packaging with the manufacturer`s name, product description and date of production.

Residek N4 5500 WSL is CE marked in accordance with EN 13707.

The approval mark for SINTEF Technical Approval TG 20657 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

Hans Boye Skogstad
Approval Manager