

SINTEF Building and Infrastructure confirms that

FUTURA RS 4 N AF single layer bituminous 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

Polyglass Spa
 Via delle industrie, 34
 IT-31047 Ponte di Piave (TV)
 Italy

www.polyglass.com

2. Product description

FUTURA RS 4 N AF is a roofing membrane made of APP-modified bitumen; copolymer of atactic polyolefin, isotactic polypropylene and flame-retardants. It is covered on the upper face by mineral granules and reinforced with a spun bond polyester stem. The membrane is manufactured in 5.0 mm thickness.

Measures and tolerances are shown in Table 1.

The membrane system is based on hot air welded or torched joints see Fig.1. The lower face has a thin plastic film, which melts off when the joints are welded. The membranes are delivered with a grey surface, but can also be delivered with green, red, white and dark brown top surface.

Table 1
Measures and tolerances of Futura RS 4 N AF¹⁾

Property	Measure and tolerances
Thickness	Ca. 4.5 mm
Weight	5.0 kg/m ² ± 10 %
Width	1 m ± 1 %
Roll length	8 m / 10 m + 10 %
Weight of reinforcement	220 g/m ² ± 15 %

¹⁾ Measured according to EN 1848-1 and EN 1849-1

3. Fields of application

FUTURA RS 4 N AF is used as a single-layer waterproofing membrane on sloping and flat roofs. The system is specially designed for mechanically fastened single layer roofing.

Roofs must have adequate slope to drain water from rain

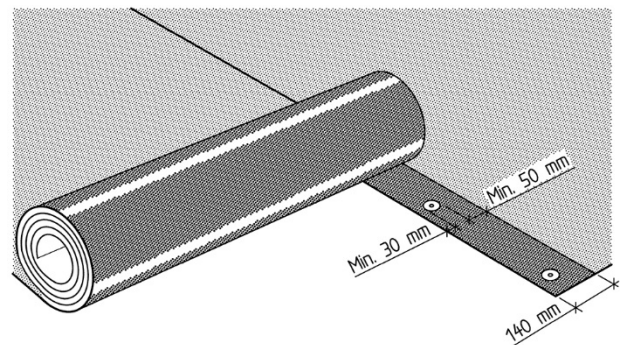


Fig. 1
FUTURA RS 4 N AF roofing membrane is mechanically fastened with 140 mm welded overlap joints. The products can be jointed both by open flame and hot air.

and melted snow. SINTEF Building and Infrastructure recommends in general a minimum slope of 1:40 for all roofs.

4. Properties

Product properties

Properties for fresh material are shown in Table 2.

Safety in case of fire

FUTURA RS 4 N AF complies with class B_{ROOF} (t2) according to EN 13501-5 for all types of underlays shown in table 3 concerning resistance against spread of flames. The testing is performed according to CEN/TS 1187-2.

Fastener capacity

The capacity for anchoring the membrane with SFS Teleskop Ø 42 plastic washer and integrated sleeve is shown in table 4. This capacity applies to the connection between the membrane and the fastener. For weak underlays the connection between the underlays and the fastener might limit the capacity. This must be considered.

The number of required fasteners is calculated according to SINTEF Building Research Design Sheets 544.206 *Mekanisk feste av asfalttakbelegg og takfolie på flate tak*, or "TPF informs No. 5" published by the Roofing Manufacturers' Research Group.

Table 2

Product properties for fresh material of FUTURA RS 4 N AF single layer bituminous roofing membrane

L/T indicates the properties for longitudinal (L) and transversal (T) directions respectively.

Property	Test method EN	DoP ¹⁾	Control limit ²⁾	SINTEF's recommended minimum performance ³⁾	Unit
Dimensional stability (L/T)	1107-1:1999	-	≤ 0.3	≤ ±0.6	%
Flexibility at low temperature Top side out/ Underside out	1109-1:2013	≤ -20 ≤ -20	≤ -20 ≤ -20	≤ -15	°C
Flow resistance at elevated temperature	1110:2010 ⁴⁾	NPD	≥ 140	≥ 90	°C
Water tightness 10 kPa/24 h	1928:2000 (A)	Pass	Pass	Pass	-
Resistance to tearing, nail shank (L/T)	12310-1:2000	250 -20%	≥ 200	≥ 150	N
Tensile strength (L/T)	12311-1:2000	≥ 800	≥ 800	≥ 600	N/50 mm
Elongation (L/T)	12311-1:2000	≥ 35	≥ 35	≥ 10	%
Average peel resistance of joints	12316-1:2000	NPD	≥ 50	≥ 50	N/50 mm
Shear resistance of joints	12317-1:2000	≥ 600	≥ 600	≥ 600	N/50 mm
Resistance to puncturing Impact +23 °C	12691:2006 (A)	≥ 1000	≥ 1000	≥ 500	mm
Impact -10 °C	12691:2001	-	≤ 20	≤ 30	mm diam
Static load	12730:2001 (A)	≥ 20	≥ 20	≥ 20	kg
Watertightness after stretching at low temp -10 °C	13897:2005	-	≥ 10/ Tight	≥ 10/ Tight	%

¹⁾ Manufacturers Declaration of Performance, DoP

²⁾ The stated values are control limits existing for internal control at the producer and by supervising control.

The control limit are consistent with the lowest range of variation for the manufacturer declared value in DoP

³⁾ SINTEF's recommended minimum performance in SINTEF Technical Approval for single layer bituminous waterproofing membrane, fresh material

L = Longitudinal, T = Transversal, NPD = No Performance Declared

Table 3

FUTURA RS 4 N AF single layer bituminous roofing membrane achieves reaction-to-fire classification class

BR00F (t2) on the following substrates

Type of sub construction	FUTURA RS 4 N waterproofing membrane
EPS	Yes
Rockwool	Yes
Wooden sheeting	Yes
Concrete	Yes
Reroofing on old membrane on EPS	Yes
Reroofing on old membrane on stone wool	Yes
Reroofing on old membrane on wooden sheeting	Yes
Reroofing on old membrane on concrete substrate	Yes

Table 4

Design capacity in ultimate limit state for fixing of FUTURA RS 4 N AF with 140 mm overlapping joints (or outside overlap)

Fastener	Capacity N/fastener
SFS Teleskop Ø 42 plastic washer and integrated sleeve	1300 ¹⁾

¹⁾ Tested according to NT Build 307

Durability

The product has been tested for durability in a hot cabinet (70 °C) for 12 weeks with acceptable results. Properties tested on aged material according to test methods given in Table 2 are weight, tensile strength and elongation, flexibility at low temperatures, impact resistance and flow resistance at elevated temperatures.

5. Environmental aspects

Substances 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 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 the product.

6. Special conditions for use and installation

Installation

The joints are torched or hot air welded, and shall be installed in accordance with the manufacturer's guidelines and the principles shown in SINTEF Building Research Design Sheets 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* and "TPF informs No. 5".

Installation of fasteners

Mechanical fasteners shall be placed at welded overlaps with a minimum width of 140 mm. The fasteners must be positioned at a distance from the membrane edges that provides minimum 30 mm bonding on the inside and minimum 50 mm bonding on the outside of the fastener, see Fig. 2.

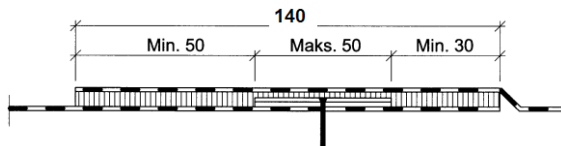


Fig. 2
Positions of mechanical fasteners in 140 mm welded overlap joints.

Fastening with ordinary steel washers in longitudinal overlaps may be used on firm underlays such as wood-based sheathing, concrete or existing bituminous roofing.

Steel washers with recess or plastic washers with an integrated sleeve should be used on underlays of thermal insulation with compressive strength ≥ 80 kN/m² (level CS(10)80 according to EN 13162/13163).

Fasteners with good telescopic effect must be used when the membrane is installed on thermal insulation materials with lower compressive strength.

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 granules of the surface in bitumen before the joint is fully welded.

Underlay

Where a fire technical classification is required the membrane can only be installed on underlays as described in Chapter 5 under the heading Safety in case of fire.

Repairs

When repairing damages the membrane must be cleaned before welding.

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.

Storage

FUTURA RS 4 N AF must be stored upright on pallets.

7. Factory production control

The product is produced by Polyglass SpA, Via delle industrie, 34, IT-31047 Ponte di Piave (TV), Italy.

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 Polyglass Spa has a quality management system certified by Certiquality in Italy to be in accordance with ISO 9001, certificate No. 15961.

Polyglass Spa has an environmental management system certified by Certiquality in accordance with ISO 14001, certificate No. 15889.

Polyglass Spa also has a product certificate from ITC, certificate no. 62303. Rina Industry performs the product control inspection regarding this certificate.

8. Basis for the approval

Product properties have been determined by type testing on fresh and aged material, documented in the following reports:

- Norwegian Building Research Institute. Report no. O 14141-2 dated 09.05.2005 (material properties).
- SINTEF Building and Infrastructure. Report no. 2018:00366 dated 2018-03-23 (thickness and weight)
- Norwegian Building Research Institute. Report no. O 14133-1 dated 12.03.2004 (fastener capacity measured according to NT Build 307).
- Norwegian Fire Research Laboratory. Report no. 102010.40/02.212 dated 10.09.2002 (spread of flames according to NT FIRE 006).
- SINTEF Building and Infrastructure, report no. 3B040307, dated 10.05.2011 (leaching test)

9. Marking

All rolls are marked on the packaging with the manufacturer's name, product description and the manufacturing date.

The product is CE marked in accordance with EN 13707.

The approval mark for SINTEF Technical Approval No. 2423 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
Approval Manager