

SINTEF confirms that

Astroflex SBS SUPRA double-layer waterproofing 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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IT-46020 Pegognaga (Mantova)
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2. Product description

Astroflex SBS SUPRA double-layer bituminous roof waterproofing membrane is a roofing system where the top layer is fully welded to the bottom layer. The system consists of Astroflex SBS 3000 SUPRA or Astroflex SBS 4000 SUPRA as underlay and Astroflex SBS 5000 SUPRA or Astroflex SBS 6000 SUPRA as top layer.

The upper face of the top layers are covered by mineral granules and the underlays are covered by sand.

Astroflex SBS 4000 SUPRA, Astroflex SBS 5000 and 6000 SUPRA are membranes made of SBS modified bitumen and reinforced with composite polyester stabilised with longitudinal glass fibres. Astroflex SBS 3000 SUPRA has the same composition as Astroflex 4000 SUPRA, but without glass fibres.

The lower face of the membranes is covered with a thin plastic film which melts off when the joints are welded.

The top layer membranes are delivered in black (other colours are available on demand).

Measurements and tolerances for the membranes are given in Table 1.

3. Fields of application

Astroflex SBS SUPRA double-layer roof waterproofing membrane can be used on sloping and flat roofs. The system is designed for mechanically fastened roofing, see figure 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.

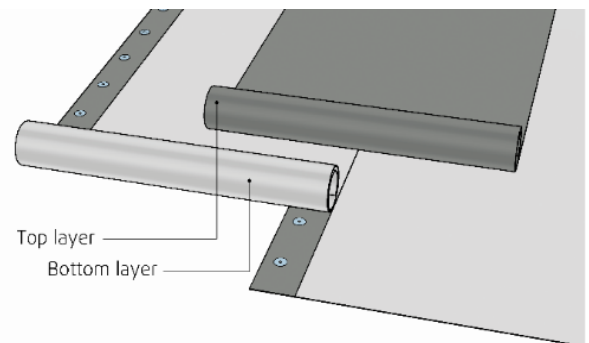


Fig. 1
Astroflex SBS SUPRA double-layer bituminous roof waterproofing membrane. The top layer is fully bonded to the underlay by welding

4. Properties

Material properties

Product properties for fresh material are shown in Table 2.

Properties related to fire

Astroflex SBS SUPRA double-layer system 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.

Durability

Astroflex SBS SUPRA double-layer system has shown satisfying properties after artificial ageing in connection with type-testing and annual control testing performed by SINTEF.

Fastening capacity

The design capacity for the fastening of the membrane is given in Table 4. This capacity applies to the connection between the membrane and the fasteners and is determined in form of a system test.

For weak substrates the connection between the substrate and the fastener might limit the capacity. This must be considered. The lowest value for the fastening in membrane/substrate must always be used.

SINTEF is the Norwegian member of European Organisation for Technical Assessment, EOTA, and European Union of Agrément, UEAtc

Table 1

Measurements and tolerances for membranes in Astroflex SBS SUPRA double-layer waterproofing system according to EN 1848-1 and EN 1849-1

Property	Underlays				Top layers			
	Astroflex SBS 3000 SUPRA		Astroflex SBS 4000 SUPRA		Astroflex SBS 5000 SUPRA		Astroflex SBS 6000 SUPRA	
	Measure	Tolerance	Measure	Tolerance	Measure	Tolerance	Measure	Tolerance
Thickness	2.5 mm	± 0.2 mm	3.0 mm	± 0.2 mm	4.5 mm	± 5 %	5.0 mm	± 5 %
Area weight	3.0 kg/m ²	± 10 %	4.0 kg/m ²	± 10 %	5.0 kg/m ²	± 5 %	5.7 kg/m ²	± 5 %
Width of roll	1 m	-1 %	1 m	-1 %	1 m	-1 %	1 m	-1 %
Length of roll	10 m	-1 %	10 m	-1 %	8 m	-1 %	5 m	-1 %
Weight of reinforcement	ca. 160 g/m ²	-	ca. 160 g/m ²	-	ca. 160 g/m ²	-	ca. 160 g/m ²	-

Table 2

Product properties for fresh material of Astroflex SBS SUPRA bituminous roofing membranes.

Property	Test method EN	Astroflex SBS						SINTEF's recommended minimum perform. ³⁾	Unit	
		3000 SUPRA 4000 SUPRA		5000 SUPRA		6000 SUPRA				
		DoP ¹⁾	Control limit ²⁾	DoP ¹⁾	Control limit ²⁾	DoP ¹⁾	Control limit ²⁾	Top layer Underlay		
Dimensional stability	1107 -1	±0.6 ±0.3	±0.6 ±0.3	± 0.3	± 0.3	≤ -0.3	± 0.3	± 0.6	%	
Flexibility at low temperature (Top side/Underside)	1109	≤ -20	≤ -20	≤ -20	≤ -20	≤ -20	≤ -20	≤ -15	°C	
Flow resistance at elevated temperature	1110	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 90	°C	
Watertightness 10 kPa / 24h	1928 (A)	-	Tight	-	Tight	-	Tight	Tight	-	
Watertightness 60 kPa / 24h	1928	Tight	-	Tight	-	Tight	-	Tight	-	
Adhesion of granules	12039	-	-	≤ 30 %	≤ 30 %	≤ 30 %	≤ 30 %	2.5 g ⁴⁾ -	-	
Resistance to tearing (nail shank)	L T	12310 -1	215 ±30 % 290 ±30 %	≥ 150 ≥ 200	265 ±30 % 395 ±30 %	≥ 185 ≥ 275	265 ±30 % 395 ±30 %	≥ 185 ≥ 275	- ≥ 150	N
Tensile strength	L T	12311 -1	625 ±20 % 565 ±20 %	≥ 500 ≥ 450	815 ±20 % 750 ±20 %	≥ 650 ≥ 600	875 ±20 % 750 ±20 %	≥ 700 ≥ 600	≥ 400	N/50 mm
Elongation at max load	L T	12311 -1	45 ± 15 45 ± 15	≥ 30 ≥ 30	45 ± 15 50 ± 15	≥ 30 ≥ 35	45 ± 15 50 ± 15	≥ 30 ≥ 35	≥ 10	%
Avg. peel resistance of joints Sidelap/Endlap		12316 -1	60 ± 10	≥ 50	60 ± 10	≥ 50	60 ± 10	≥ 50	- ≥ 50	N/50mm
Shear resistance of joints Sidelap/Endlap		12317 -1	500 ±20 %	≥ 400	750 ±20 %	≥ 600	750 ±20 %	≥ 600	- ≥ 400	N/50mm
Resistance to puncture by - Impact +23 °C - Impact -10 °C - Static loading		12691 (A) 12691:2001 12730 (A)	≥ 600 ≥ 800 - ≥ 15	≥ 600 ≥ 800 - ≥ 15	≥ 900 - ≥ 20	≥ 900 ≤ 30 ⁵⁾ ≥ 20	≥ 900 - ≥ 20	≥ 900 ≤ 30 ⁵⁾ ≥ 20	≥ 500 - ≥ 15	mm mm diam. kg
Watertightness after stretching at low temp. (10% elongation at -10 °C)		13897	-	-	-	Pass ⁵⁾		Pass ⁵⁾	-	-

¹⁾ The manufacturers Declaration of performance, DoP²⁾ Control limits show 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 the top layer/underlay in double-layer bituminous waterproofing membranes⁴⁾ Modified to give the result of weight loss of granules in gram⁵⁾ Control limit for the product used as a single layer membrane

L = Longitudinal

T = Transversal

Table 3

Astroflex SBS SUPRA double-layer system has fire classification B_{ROOF} (t2) on following substrates

Type of substrate	Astroflex SBS 3000/4000 SUPRA + 5000/6000 SUPRA
EPS ^{1) 2)}	Yes
Stone wool ¹⁾	Yes
Wood particle board ¹⁾	Yes
Concrete / Calcium silicate plate ¹⁾	Yes
Old roofing membrane on EPS ²⁾	Yes
Old roofing membrane on stone wool	Yes
Old roofing membrane on wood particle board	Yes
Old roofing membrane on concrete / calcium silicate plate	Yes

¹⁾ Standard substrate according to CEN/TS 1187, test 2

²⁾ In case of roofing on lightweight combustible insulation (eg EPS 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 capacity at ultimate limit state for the fastening of Astroflex SBS SUPRA double layer roof waterproofing membrane

Fastener/Fastening system Fastening in 120 mm welded joint	Design capacity N/fastener
SFS ISO-TAK R45 Tested on soft substrate, attachment in steel plate Distance between fasteners: C/C 480 mm	800 ¹⁾

¹⁾ Measured according to method NT Build 307

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" published by Takprodusentenes Forskningsgruppe (TPF), see www.tpf-info.org.

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 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

Installation

Astroflex SBS 3000/4000 SUPRA underlay shall be mechanically fastened in 120 mm welded overlaps (sidelap). The fasteners must be positioned at a distance from the membrane edges that provides minimum 25 mm bonding on the inside and minimum 45 mm bonding on the outside of the fastener, see figure 2.

Astroflex SBS 5000/6000 SUPRA top layer shall be installed with 100 mm welded overlaps, and the top layer shall be fully welded to the underlay.

The bonding may be performed with either hot air welding or open flame torching.

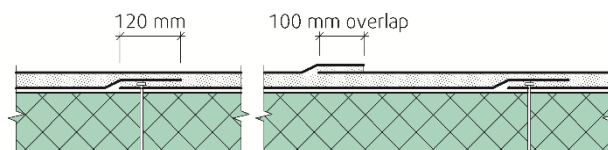


Fig. 2

Fastening and overlap of Astroflex SBS SUPRA double-layer system

In the case of roofing directly on a combustible surface, the underlay must be welded without the use of an open flame or carried out in such a way that the insulation is not damaged. Protection with a non-combustible layer between the underlay and the substrate is recommended in accordance with "TPF informerer no. 6", chapter 3.2, published by Takprodusentenes Forskningsgruppe (TPF), see www.tpf-info.org.

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.

The roofing membrane shall generally be installed in accordance with the vendor's installation manual and the principles shown in SINTEF Building Research Design Guides 544.203 *Asfalt takbelegg. Egenskaper og tekking*, 544.204 *Tekking med asfalttakbelegg eller takfolie. Detaljløsninger*, 544.206 *Mekanisk innfesting av asfalttakbelegg og takfolie på skrå og flate tak*, plus "TPF informerer nr. 5" published by Takprodusentenes Forskningsgruppe (TPF), 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 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 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 SINTEF Building Research Design Guide no. 525.207 *Kompakte tak* and 520.339 *Bruk av brennbar isolasjon i bygninger*", plus "TPF informerer nr. 6 *Branntekniske konstruksjoner for tak* published by Takprodusentenes Forskningsgruppe.

Cleaning and maintenance

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.

Maintenance/cleaning

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

Astroflex SBS 3000, 4000, 5000 and 6000 SUPRA must be stored upright on pallets.

7. Factory production control

The products are produced by:
Copernit S.p.A.
via Provinciale Est 64,
IT-46020 Pegognaga (Mantova)
Italy

The holder of the approval is responsible for the factory production control 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 has a quality management system certified according to EN ISO 9001.

8. Basis for the approval

The evaluation of "*The product*" 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

Each roll of the product shall be marked with the manufacturer's name, product, product description and production batch number. The approval mark for SINTEF Technical Approval no. 20283 may also be used.

The product is CE-marked accordance with EN 13707

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



Susanne Skjervø
Approval Manager