

SINTEF Building and Infrastructure confirms that

Astroflex double-layer roof 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

Copernit S.p.A.
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 IT-46020 Pegognaga (Mantova)
 Italy
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2. Product description

Astroflex 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 4000 SUPRA as bottom layer and Astroflex SBS 5000 SUPRA or Astroflex SBS 6000 SUPRA as top layer. The top layers are covered on the upper face by mineral granules and the bottom layer on the upper face by sand. Astroflex SBS 4000 SUPRA, Astroflex SBS 5000 and 6000 SUPRA are roofing membranes made of SBS modified bitumen and reinforced with composite polyester stabilised with longitudinal glass fibres.

The lower face 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).

The bottom layer is mechanically fastened to the under layer, and the joints are welded with torch flame or hot-air, see fig. 1. Measurements and tolerances for the membranes are given in Table 1.

Table 1
 Measurements and tolerances for Astroflex 4000 SUPRA
 and Astroflex 5000/6000 SUPRA

Designation	Astroflex SBS 4000 SUPRA		Astroflex SBS 5000/6000 SUPRA	
	Measurements	Tolerance	Measurements	Tolerance
Thickness	3,0 mm	± 0,2 mm	4,5 / 5,0 mm	± 5%
Weight	4,0 kg/m ²	± 10 %	5,0/5,7 kg/m ²	± 5 %
Width	1 m	± 1 %	1 m	± 1 %
Roll length	10 m	-0/+2 %	7,5 m	-0/+2 %
Weight of reinforcement	Ca. 160 g/m ²		Ca. 160 g/m ²	

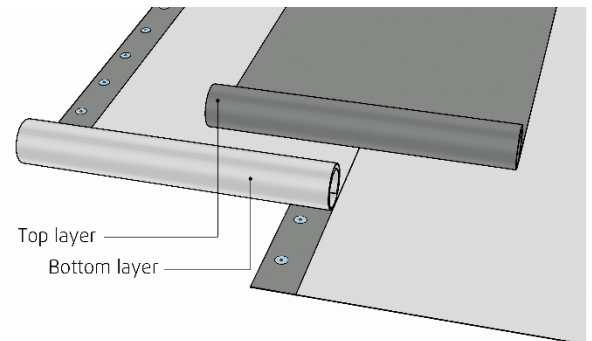


Fig. 1
 Astroflex double-layer bituminous roof waterproofing membrane. The top layer is fully bonded to the bottom layer by welding

3. Fields of application

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

The slope of the roof must be sufficient to allow rain and melting water to drain away. SINTEF Building and Infrastructure recommends a slope of at least 1:40 for all roofs.

4. Properties

Material properties

Product characteristics for fresh material are shown in Table 2.

Table 2 Product characteristics for fresh material of Astroflex bituminous roofing membranes.

Property	Test method EN	Astroflex						SINTEF recommended minimum perform. ³⁾	Unit
		Astroflex SBS 4000 SUPRA		Astroflex SBS 5000 SUPRA		Astroflex SBS 6000 SUPRA			
		DoP ¹⁾	Control limit ²⁾	DoP ¹⁾	Control limit ²⁾	DoP ¹⁾	Control limit ²⁾	top layer	
Dimensional stability	1107 -1 :1999	± 0,3	± 0,3	± 0,3	± 0,3	≤ -0,3	± 0,3	± 0,6	%
Flexibility at low temp. (Top side/Underside)	1109 :2013	≤ -20	≤ -20	≤ -20	≤ -20	≤ -20	≤ -20	≤ -15	°C
Flow resistance at elevated temperature	1110 :2010	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 100	≥ 90	°C
Watertightness 10kPa / 24t	1928 :2000 (A)	Tight	Tight	Tight	Tight	Tight	Tight	Tight	-
Adhesion of granules ⁴⁾	12039 :2000	-	-	≤ 30 %	≤ 30 %	≤ 30 %	≤ 30 %	2,5 -	g ⁴⁾
Resistance to tearing (nail shank)	L: T: 12310 -1 :2000	215 ± 65 290 ± 87	≥ 150 ≥ 200	265 ± 80 395±119	≥ 185 ≥ 275	265 ± 80 395 ±119	≥ 185 ≥ 275	- ≥ 150	N
Tensile strength	L: T: 12311 -1 :2000	625 ± 125 565 ± 113	≥ 500 ≥ 450	815 ±163 750 ±150	≥ 650 ≥ 600	875 ±175 750 ±150	≥ 700 ≥ 600	≥ 400	N/50 mm
Elongation	L: T: 12311 -1 :2000	45 ± 15 45 ± 15	≥ 30 ≥ 30	45 ± 15 50 ± 15	≥ 30 ≥ 35	45 ± 15 50 ± 15	≥ 30 ≥ 35	≥ 10	%
Avg. peel resistance of joints	12316 -1 :2000	125 ± 25	≥ 100	75 ± 15	≥ 60	75 ± 15	≥ 60	-	N/50mm
Max. peel resistance of joints		150 ± 30	≥ 120	100 ± 20	≥ 80	100 ± 20	≥ 80	≥ 50	
Shear resistance Of joints	L: T: 12317 -1 :2000	500 ± 100 500 ± 100	≥ 400	750 ±150 750 ±150	≥ 600	750 ±150 750 ±150	≥ 600	- ≥ 400	N/50mm
Resistance to puncturing	12691 :2006 (A) 12691:2001 12730 :2001 (A)	≥ 800	≥ 800	≥ 900	≥ 900	≥ 900	≥ 900	≥ 500	mm
Impact +23 °C:		-	-	-	≤ 30	-	≤ 30	-	
Impact -10 °C:		-	-	-	≤ 30	-	≤ 30	-	
Static load:	12730 :2001 (A)	≥ 15	≥ 15	≥ 20	≥ 20	≥ 20	≥ 20	≥ 15	kg
Watertightness after stretching at low temp. -10 °C	13897:2005	-	-	-	≥ 10	-	≥ 10	-	%

¹⁾ Declared value given in Declaration of performance, DoP

²⁾ The declared values are control limits both for internal control at the producer and for supervising control. If nothing else is mentioned, the control limits concern both direction of the product where relevant.

³⁾ SINTEF's recommended minimum performance in SINTEF Technical Approval for the top layer/bottom layer in two layer bituminous waterproofing membranes

⁴⁾ Modified in mass loss of granules in grams according to EN 544

Properties related to fire

Astroflex double-layer system fulfils the requirements of class B_{ROOF} (t2) according to EN 13501-5 for underlays as given in Table 5. The products have been tested in accordance with CEN/TS 1187.

Table 3.

Astroflex double-layer system fulfils the requirements of class B_{ROOF} (t2) for the following underlays

Type of substrat	SBS 4000/5000/6000 SUPRA
EPS	Yes
Stone wool	Yes
Wooden roof boards	Yes
Concrete / Silicate board	Yes
Old roofing membrane on EPS	Yes
Old roofing membrane on stone wool	Yes
Old roofing membrane on wooden roof boards	Yes
Old roofing membrane on concrete/silicate board	Yes

Durability

Astroflex double-layer system has shown satisfying properties after artificially ageing and yearly control testing performed by SINTEF Byggforsk.

Calculation of fasteners

The capacity for anchoring the membrane is given in Table 4. This capacity applies to the connection between the membrane and the fastener according to EN 16002.

Table 4.

The capacity for anchoring Astroflex double layer roof waterproofing membranes with a fastener of Astroflex SBS SUPRA in a 120 mm overlap joint

Fixing	Capacity N/piece
SFS ISO-TAK R45	800

For weak underlays, the connection between the underlay and the fastener might limit the capacity. This must be considered. The lowest value for membrane/underlay must always be used.

Calculation of fastener spacing is carried out according to SINTEF Building Research Design Sheet no. 544.206 "Mekanisk feste av asfaltbelegg og takfolie på flate tak" and "TPF Informs No. 5" issued by Takprodusentenes Forskningsgruppe.

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, ground water or drinking water.

Waste treatment/recycling

The roofing membranes may be recycled, or shall be sorted as mixed 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 Astroflex SBS 4000, 5000 and 6000 SUPRA.

6. Special conditions for use and installation

Design considerations

The joints are torched or welded with hot air, and shall be installed in accordance with the principles shown in SINTEF Building Design Sheets 544.203 "Asfalttakbelegg. Egenskaper og tekking", 544.204 "Tekking med asfalttakbelegg eller takfolie. Detaljløsninger", 544.206 "Mekanisk feste av asfalttakbelegg og takfolie på flate tak" and in "TPF informs No. 5" issued by Takprodusentenes Forskningsgruppe.

Underlay

When a fire classification is required the underlay must be in accordance with the provisions stated in section 5 "Properties related to fire", table 3.

For re-roofing on old roofing that contains softeners as for example PVC a separate migration barrier of approximately 150 g/m² polyester felt has to be used.

Fasteners

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

On underlays of thermal insulation with good compression strength, such as expanded polystyrene (EPS) with compression strength of at least 80 kN/m² (level CS(10)80 according to EN 13162/13163), steel washers with deep collars or plastic washers should be used.

Fasteners with good telescopic effect must be used when the membrane is installed on thermal insulation materials with lower compressive strength. The tightening of the fasteners must be specially checked.

Installation of fasteners

Astroflex SBS 4000 SUPRA bottom layer shall be mechanically fastened with 120 mm overlap which is entirely welded over the width. 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 Fig. 2. The bonding could be performed with either hot air welding or open flame torching.

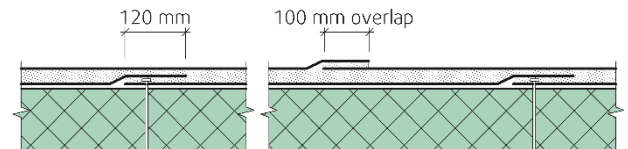


Fig. 2. Fastening and overlap of Astroflex double-layer system

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

Transverse joints must have 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.

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.

Transport and storage

Astroflex SBS 4000, 5000 and 6000 SUPRA must be stored in an upright position.

7. Factory production control

The product is 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, Copernit S.p.a, has a quality management system certified by Bureau Veritas Italia S.p.A. in compliance with EN ISO 9001, certificate No 176322.

8. Basis for the approval

Product properties have been verified by tests carried out at SINTEF Building and Infrastructure (SINTEF) and Sveriges Tekniska Forskningsinstitut (SP), documented in the following reports:

- SP Report No. F703401, dated 2008-11-07, material testing and durability testing.
- SP Report No. P900167, dated 2010-02-25, material testing and durability.
- SINTEF Report No. 3D116102, dated 2011-05-19, type testing.
- SINTEF Report No. 3D1386, dated 2012-06-29, type testing.
- SINTEF. Report No. 3D0778, dated 2009-10-28, wind load testing
- SINTEF. Report No. 3D116103, dated 2011-04-29, leachin test.
- SINTEF NBL Report No. 102010.40/12.046, dated 2012-09-13, fire test

Fastening capacity of the roofing membranes are based on system tests according to NT Build 307.

9. Marking

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