

SINTEF confirms that

Technoelast K-YS 5500 single sheet bituminous 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

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2. Manufacturer

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3. Product description

Technoelast K-YS 5500 is a single sheet bituminous roofing membrane made of SBS modified bitumen, reinforced with a layer of composite polyester. Membranes are based on a welded overlapping system, see fig.1. At the upperface are slate-granules added. The lowerface is protected by a thin plastic-foil which melts by welding overlapping. Joints can be torched or hot air welded. Technoelast K-YS 5500 can be delivered with different coloured slates. Measures and tolerances are given in table 1.

Table 1
 Measures and tolerances for Technoelast K-YS 5500¹⁾

Property	K-YS 5500	Tolerance
Thickness	4.3 mm	± 0.2 mm
Weight	5.5 kg/m ²	± 0.25 kg/m ²
Roll width	1 m	+5 / -0 mm
Roll length	8.0 m	+40 / -0 mm
Weight of reinforcement	ca. 250 g/m ²	-

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

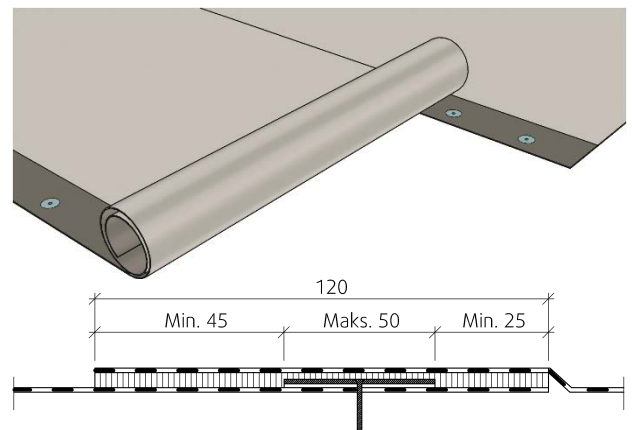


Fig. 1
 Technoelast K-YS 5500 mechanically fixed in a 120 mm welded side-overlapp

4. Fields of application

Technoelast K-YS 5500 is used as single layer membrane for covering sloped and flat roofs. The system is designed specially for use as mechanically fixed single roofing membranes. See fig. 1. Technoelast K-YS 5500 can be used for new roofing or under rehabilitation.

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

In general Technoelast K-YS 5500 waterproof membrane can also be used for loose applied ballasted accessible and non-accessible roofs, terrace roofs and parking roofs with floating floor and culverters.

5. Properties

Product-properties:

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

Table 2

Product-properties for fresh material of Technoelast K-YS 5500 single layer bituminous membranes

Property	Test method	DoP ¹⁾	Control limit ²⁾	SINTEFs recommended minimum performance ³⁾	Unit
Dimension stability	EN 1107 -1 :1999	$\leq \pm 0.3$	$\leq \pm 0.3$	$\leq \pm 0.6$	%
Flexibility at low temperature upper face: lower face:	EN 1109 -1 :1999	$\leq - 25$ $\leq - 25$	$\leq - 25$ $\leq - 25$	$\leq - 15$ $\leq - 15$	°C
Flow resistance at elevated temperature	EN 1110 :1999	≥ 100	≥ 100	≥ 90	°C
Water tightness 10kPa / 24t:	EN 1928 :2000 (A)	Tight	Tight	Tight	-
Adhesion of granules ⁴⁾	EN 12039 :2000	$\leq 30\%$	≤ 2.5	≤ 2.5	G
Resistance to tearing, nail shank L: T:	EN 12310 -1 :2000	$\geq 300 \pm 60$ $\geq 300 \pm 60$	≥ 240 ≥ 240	≥ 150 ≥ 150	N
Tensile strength L: T:	EN 12311 -1 :2000	$\geq 900 \pm 100$ $\geq 700 \pm 100$	≥ 800 ≥ 600	≥ 600 ≥ 600	N/50 mm
Elongation L: T:	EN 12311 -1 :2000	$\geq 50 \pm 25$ $\geq 50 \pm 25$	≥ 25 ≥ 25	≥ 10 ≥ 10	%
Average peel resistance of joints L: T:	EN 12316 -1 :2000	$\geq 90 \pm 30$ $\geq 150 \pm 30$	≥ 60 ≥ 120	≥ 50 ≥ 50	N/50mm
Shear resistance of joints L: T:	EN 12317 -1 :2000	$\geq 650 \pm 50$ $\geq 650 \pm 50$	≥ 600	≥ 600 ≥ 600	N/50mm
Resistance to puncturing Impact +23 °C: Impact -10 °C: Static load:	EN 12691 :2006 (A) EN 12691 :2001 EN 12730 :2001 (A)	≥ 1500 ≤ 20 ≥ 20	≥ 1500 ≤ 20 ≥ 20	≥ 500 ≤ 30 ≥ 20	mm mm diam Kg
Water tightness after elongation at low temperature	EN 13897 :2005	-	≥ 10	≥ 10	%

¹⁾ The manufacturers Declaration of performance, DoP

²⁾ Control limit shows values, product has to satisfy during internal factory production control and audit testing.

³⁾ SINTEFs recommended minimum performance in SINTEF Technical Approval for single layer bituminous waterproofing membrane

⁴⁾ Modified to loss of granules in gram.

Properties related to fire

Technoelast K-YS 5500 fulfills the requirements of class B_{ROOF}(t2) according to EN 13501-5 for underlays, shown in table 3. The products have been tested in accordance with CEN/TC 1187-2.

Durability

Technoelast K-YS 5500 was tested for durability belonging to technical approvals both for typeapproval and for several control tests. The product was tested 12 and 24 weeks in heatchamber at (70 °C) and was assessed as satisfactory.

Properties which are tested on aged material, according to the standards mentioned in table 2, are tensile strength together with elongation, flexibility at low temperature and watertightness after stretching at low temperature.

Calculation of fasteners

The capacity for anchoring Technoelast K-YS 5500 and the documented anchoring systems are shown in table 4. This capacity applies to the connection between the membrane and the fastener according to EN 16002. 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 and "TPF Informs No. 5".

Table 3

Technoelast K-YS 5500 achieves reaction-to-fire classification class B_{ROOF}(t2) on following substrates

Type of substrate	Astroflex membranes
EPS	No
Rock wool	Yes
Wooden sheeting	No
Concrete	Yes
Reroofing on old membrane on EPS	No
Reroofing on old membrane on rock wool	Yes
Reroofing on old membrane on wooden sheeting	No
Reroofing on old membrane on concrete	Yes

Table 4

Design capacity in ultimate limit state for Technoelast K-YS 5500

Fastener	Capacity N/piece
SFS Iso-tak R45 with BS-4,8xL	690

6. Environmental aspects

Substances hazardous to health and environment

Technoelast K-YS 5500 is containing 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

Technoelast K-YS 5500 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 Technoelast K-YS 5500.

7. Special conditions for use and installation

Fasteners

Fastening with ordinary steel washers and screws in longitudinal overlaps may be used on firm underlays such as woodbased sheathing or concrete.

On underlays of thermal insulation with a compression strength of at least 80 kPa/m² (level CS (10) 80 according to EN 13162/13163), steel washers with deep collars or telescopic 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

The joints of Technoelast K-YS 5500 can be torched or hot air welded, and shall be installed in accordance with the principles shown in SINTEF Building Design Sheets 544.203, 544.204 and 544.206 and in "TPF informs No. 5".

Mechanical fasteners shall be placed at welded overlaps with a minimum width of 120 mm. 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. 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.

Underlay

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

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.

Traffic on the roof 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. Before repairing the roofing membrane, the surfaces have to be cleaned before welding starts.

Storage

Technoelast K-YS 5500 must be stored in an upright position.

8. Factory production control

Technoelast K-YS 5500 is subject to supervisory factory production and product control according to contract between SINTEF AS and LLC "Technoflex" concerning Technical Approval

LLC "Technoflex" has a quality management system what is certified of ACERT Bureau, St. Petersburg, Russian Federation according to ISO 9001, certificate no: Q-08.00.05d.

9. Basis for the approval

Produktproperties have been determined by initial typetestings on fresh and aged material, audit testings under annual control, documented in following reports:

- SP Sverige, Report F616096, dated 2006-09-18, Wind uplift test according ETAG 006.
- VTT Finland, Report VTT-S-09477-06, dated 2006-10-17, Additional tests of K-YS 5500 for CE-marking
- VTT Finland, Report VTT-S-00819-09, dated 2009-02-05, Quality control test 2008
- VTT Finland, Report VTT-S-08291-09, dated 2009-11-11, Quality control test 2009
- VTT Finland, Report VTT-S-09715-10, dated 2010-12-02, Quality control test 2010
- VTT Finland, Report VTT-S-09156-11, dated 2011-12-20, Quality control test 2011
- VTT Finland, Report VTT-S-8218-12, dated 2012-12-10, Determination of external fire exposure
- VTT Finland, Report VTT-S-8217-12, dated 2012-12-10, Determination of external fire exposure
- VTT Finland, Report VTT-S-08676-12, dated 2012-12-19, Quality control test 2012
- VTT Finland, Report VTT-S-3287-13, dated 2013-05-10, Determination of external fire exposure
- SINTEF, Report 102004415-4, dated 2013-08-07, Leachingtest for chemical substances
- SINTEF, Report 102004415-4, dated 2013-10-9, Wind-uplift-test according EN 16002

10. Marking

Materialwrapping shall be marked with product description and production date.

The product is CE marked in accordance with EN 13707

The approval mark for SINTEF Technical Approval No. 20377 may also be used.



Approval mark

11. 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

12. Technical management

Project manager at SINTEF for this approval is Holger Halstedt, dep. Architecture, Materials and Structures, Trondheim.

for SINTEF

A handwritten signature in blue ink that reads "Marius Kvalvik".

Marius Kvalvik
Approval Manager