

SINTEF confirms that

IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN single layer roofing 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

IKO nv
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 BELGIUM
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2. Product description

IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN single layer bituminous roofing membranes are made of SBS modified bitumen and reinforced with a felt of polyester. The membranes are based on a welding overlapping system, see fig.1.

The upper face of IKO powerflex 5500 AD/F SN is covered by dark mineral-granules, while IKO Carrara Tecno SN is covered by white mineral granules; otherwise the products are identical. The lower face and the overlaps are protected by a thin plastic foil which melts by welding. Joints can be torched or hot air welded.

IKO powerflex 5500 AD/F SN can be supplied with different colour of granules.

Measures and tolerances are given in table 1.

Table 1 Measurements and tolerances for IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN ¹⁾

Property	Measure	Tolerance	Unit
Thickness (indicative)	4.7	-	mm
Weight	5.7	- 0.2 / + 0.8	kg/m ²
Width	1 m	- 0 / + 0.005	m
Roll length	7.5 m	- 0 / + 0.01	m
Weight of reinforcement	ca. 230	-	g/m ²

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

3. Fields of application

IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN can be used for covering of sloped and flat roofs.

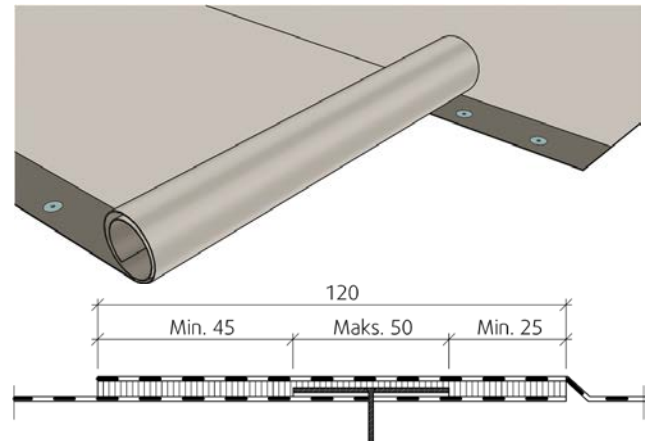


Fig. 1
IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN mechanically fixed in a 120mm welded side overlap.

IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN is designed for mechanically fastened single membrane roofing, see fig. 1. The system can be used for new roofing or rehabilitation.

IKO powerflex 5500 AD / F SN and IKO Carrara Tecno SN can also be used as a loosely laid, ballasted or built-in membrane. Relevant applications are shingle and mulch ballasted constructions, parking decks with concrete and culverts.

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. Properties

Material properties

Product properties for fresh material are shown in table 2.

Properties related to fire

IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN have a reaction to fire classification B_{ROOF} (t2) according to EN 13501-5 on substrates shown in table 3. Testing is performed according to CEN/TS 1187 test 2.

Table 2

Product properties for fresh material of IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN single layer roofing membrane

Property	Test method EN	DoP ¹⁾	Control limits ²⁾	SINTEF's recommended minimum performance ³⁾	Unit
Dimensional stability	1107-1	-	$\leq \pm 0.3$	$\leq \pm 0.6$	%
Flexibility at low temperature upper face: lower face:	1109-1	≤ -15	≤ -15	≤ -15	°C
Flow resistance at elevated temperature	1110	-	≥ 100	≥ 90	°C
Watertightness 10 kPa/24 h	1928 (A)	Tight	Tight	Tight	-
Adhesion of granules ⁴⁾	12039	-	≤ 2.5	≤ 2.5	g ⁴⁾
Resistance to tearing (nail shank) L: T:	12310-1	≥ 200 ≥ 250	≥ 200 ≥ 250	≥ 150	N
Tensile strength L: T:	12311-1	$1000 \pm 20\%$ $750 \pm 20\%$	≥ 800 ≥ 600	≥ 600	N/50 mm
Elongation L: T:	12311-1	40 ± 15 45 ± 15	≥ 25 ≥ 30	≥ 10	%
Average peel resistance of joints Sidelap Endlap	12316-1	≥ 100 ≥ 200	≥ 100 ≥ 200	≥ 50	N/50 mm
Shear resistance of joints Sidelap/Endlap	12317-1	≥ 600	≥ 600	≥ 600	N/50 mm
Resistance to Impact +23 °C Impact -10 °C Static loading	12691 (A) 12691:2001 12730 (A)	≥ 1250 - ≥ 20	≥ 1250 ≤ 30 ≥ 20	≥ 500 ≤ 30 ≥ 20	mm mm diam. kg
Watertightness after stretching at low temperature (10% elongation at -10 °C)	13897	-	Tight	Tight	-

¹⁾ The manufacturers Declaration of performance, DoP.²⁾ Control limit shows values that the product has to satisfy 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 only give the result of weight loss of granules in gram.

L = Longitudinal T = Transversal

Table 3

IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN have fire classification B_{ROOF} (t2) on following substrates

Type of substrate	IKO powerflex 5500 AD/F SN	IKO Carrara Tecno SN
EPS **	No	No
PIR* / **	Yes	No
Stone wool	Yes	Yes
Wood particle board	Yes	Yes
Concrete / silicate plate	Yes	Yes
Old roofing membrane on EPS *	No	No
Old roofing membrane on PIR* / **	Yes	No
Old roofing membrane on stone wool	Yes	Yes
Old roofing membrane on particle board	Yes	Yes
Old roofing membrane on concrete or silicate plates	Yes	Yes

*) Fire technical classification for PIR applies only to the tested PIR product "IKO Enertherm ALU 50 mm", with a density of 36 kg/m³.

**) In case of roofing on lightweight combustible insulation (eg EPS, XPS or PIR): See section 6 Condition for use, in section on substrates, on the requirements for replacement of flammable insulation for non-combustible around passages and against adjacent structures.

Durability

IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN have shown satisfying properties after artificial ageing.

Calculation of fasteners

The design capacity for tested fasteners is given in table 4. The capacity applies to the connection between the membrane and the fasteners and determined in form of a system test according to EN 16002.

Table 4

Design capacity at ultimate limit state for fastening of IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN single layer roofing membranes

Fastener/Fastening system	Design capacity N / fastener
- Afast BS-4.8 self drilling screw - Afast Guardian RP45-090 KOMBI plastic-washer with integrated sleeve	920 ¹⁾

¹⁾ Measured according to method EN 16002 and the safety factor used in Norway $\gamma_m=1.3$.

For weak substrates the connection between the substrate and the fastener might limit the capacity. This must be considered, and only the lowest capacity for membrane or substrate underlays must always be used.

Calculation of fastener spacing is carried out according to SINTEF Building Research Design Guide no. 544.206 *Mekanisk feste av asfalttakbelegg og takfolie på flate tak* and "TPF informerer nr. 5", 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

The joints of IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN can be torched or hot air welded and shall be installed in accordance with the principles shown in SINTEF Building Research Design Guide no. 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*, in "TPF informerer nr. 5", see www.tpf-info.org, and producer's installation manual.

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.

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 $\geq 80 \text{ kN/m}^2$ (level CS (10) 80 according to EN 13162 or EN 13163), steel washers with deep collars or telescopic 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 be checked particularly. *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*.

Substrate of combustible insulation as EPS, XPS 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 "TPF informerer nr. 6" *Branntekniske konstruksjoner for tak* published by Takprodusentenes Forskningsgruppe, see www.tpf-info.org.

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

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 manufacturer's guidelines.

Storage

IKO powerflex 5500 AD/F SN and IKO Carrara Tecno SN must be stored in an upright position on pallets.

7. Factory production control

The product is produced by IKO nv, D'Herbouvillekaai 80, B-2020 Antwerpen, BELGIUM

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.

IKO nv has a quality management system that is certified according to ISO 9001:2015 and an environmental management system that is certified according to ISO 14001:2015.

8. Basis for the approval

Product properties for IKO powerflex 5500 AD/F SN has been determined by type testing on fresh and aged material, documented in the following reports:

- SINTEF Building and Infrastructure, Report 3D1492, dated 2012-12-18, Wind-uplift-testing.
- SINTEF Building and Infrastructure, Report 102004575-4, dated 2013-11-19, Typetesting
- SINTEF, Report 102000594-2015 IKO nv control report, tear resistance
- Kiwa N.V., report 0011-L-19/1, dated 2019-03-18, fire testing IKO powerflex
- Kiwa N.V., report 0011-L-19/2, dated 2019-03-18, fire classification IKO powerflex
- Kiwa N.V., report 0012-L-19/1, dated 2019-03-18, fire testing IKO powerflex
- Kiwa N.V., report 0012-L-19/2, dated 2019-03-18, fire classification IKO powerflex
- Kiwa N.V., report 0013-L-19/1, dated 2019-03-18, fire testing IKO Carrara
- Kiwa N.V., report 0013-L-19/2, dated 2019-03-18, fire classification IKO Carrara
- Kiwa N.V., report 0014-L-19/1, dated 2019-03-18, fire testing IKO Carrara
- Kiwa N.V., report 0014-L-19/2, dated 2019-03-18, fire classification IKO Carrara
- Kiwa N.V., report 0453-L-14/1, dated 2015-02-10, fire testing Polygum SBS (IKO powerflex), PIR
- Kiwa N.V., report 0453-L-14/2, dated 2015-02-10, fire classification Polygum SBS (IKO powerflex), PIR

9. Marking

Material wrapping shall be marked with producer, product description and production date.

The product is CE marked in accordance with EN 13707.

The approval mark for SINTEF Technical Approval No. 20385 may also be used.



Approval mark

10. Liability

The holder/manufacture 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

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Approval Manager