Construction

Sikaplan® WT 2260-15 HL

Sheet waterproofing membrane - Tunnel

Product Description

Sikaplan® WT 2260-15 HL is a homogenous sheet waterproofing membrane based on linear low density polyethylene (PE-LLD) with one side textured and with white signal layer.

Uses

- Waterproofing of tunnels and other underground structures

Characteristics/ Advantages

- Resistant to ageing
- Optimized tensile strength and elongation
- Resistant to root penetration and micro-organisms
- Dimensional stable
- Flexible in cold temperatures
- Heat weldable
- Suitable for contact with acidic soft water (low pH aggressive to concrete surfaces)
- Can be installed on damp and wet surfaces
- Bitumen resistant
- Free from recycled material
- Free from heavy metals as cadmium, lead and halogenated flame retardants
- Free from DEHP (DOP) plasticizing agent

Approval/Standards

- Reaction to fire according to EN 13501-1, class E
- Flammability and combustibility according to DIN 4102/part 1, class B2
- Product Declaration EN 13491- Geosyntetic barriers
- CE-marking (FPC-certificate no.0799-CPR-231)
- Watertight membrane and welds according to SP 2184:1996
- Mechanical resistant according to SP 2190:1996
- > 120 years technical life time of the membrane, the welds and the combination with Sikadur-Combiflex SG Tape system- also immersed in alkaline solution
- Self-extinguishing test according to ISO 4589-2
- Resistance to impact load (500g/750mm)- EN 12691
- Oxidation resistance, change < 25 %, EN 14575
- Behaviour after storage in aqueous solutions (Method B) at 23 °C (90 days), change < 25 %, EN 14415
- Behaviour after storage in aqueous solutions (5-6 % sulfurous acid) at 23 °C (90 days), change < 20 %, EN 1847
- Behaviour at cooling, no crack formation at -20 °C, EN 495-5
- Crack resistance > 200 h, EN 14576 and ASTM D 5397

Product Data

Appearance/Colours

Surface:	Textured at one side
Colour:	Black with white (textured) signal layer

Packaging

Thickness:	1,50 mm
Weight:	1,60 (1,45) kg/m²
Roll length:	customized
Roll width:	2,5-8 m

Storage Conditions

Rolls shall be stored in their original package, in horizontal position and under cool and dry conditions. They shall be protected from direct sunlight, rain, snow, ice etc. The product does not expire during correct storage. Do not stack pallets of rolls during transport or storage.

Technical Data

Product declaration	EN 13491 – Geosyntetic barriers – Characteristics required for use as a fluid barrier in the construction of tunnels and underground structures.	
Chemical base	Linear low density polyethylene (PE-LLD)	
General characteristics	Free from bubbles, cracks, shrinkage, cavities and other visible defects. Fully bonded signal layer.	DIN EN 1850-2
Length	Acc. to customer requirement (+/- 1%)	DIN EN 1848-2
Width	Acc. to customer requirement (+/- 1%)	DIN EN 1848-2
Straightness	≤ 50 mm	DIN EN 1848-2
Flatness	≤ 50 mm	DIN EN 1848-2
Weight	1,60 (1,45) kg/m^2	DIN EN 1849-2
Total thickness (incl. signal layer)	1,5 mm (+/- 5%)	DIN EN 1849-2
Signal layer thickness	≤ 0,4 mm	DIN EN 1849-2
Density	0,934 (-/+0,005) g/cm^3	EN ISO 1183
Melt flow rate (190/5,0)	≤ 1,5 g/10 min	EN ISO 1133
Tensile strength at break	30 (28) N/mm^2 (specimen type 5, velocity 100 mm/min, by extensometer)	EN ISO 527-1,3
Elongation at break	800 (750) % (specimen type 5, velocity 100 mm/min, by extensometer)	EN ISO 527-1,3
Burst strength	≥ 20 %	EN 14151
Permeability to liquids	Leakproof	EN 14150
Gas permeability	6,03 x 10^{-3} mol/(m^2 x d)	ASTM D 1434
Perforation resistance	750 mm (impervious)	EN 12691
Performance of seams	Complies	DVS 2225-2
Dimensional stability	+/- 2% (1h/100ºC)	EN 1107-2

Foldability at low temperature	**low**No crack (at - 20ºC)	EN 495-5
Resistance to weathering	To be covered within 3 months (reduction of tensile strength and elongation < 25 % of original values). Durable and resistant for at least 25 years	EN 12224
Resistance to oxidation	Reduction of tensile strength and elongation < 25 % of original values	EN 14575
Reaction to fire	Class E	EN 13501-1
Flammability **and combustibility**	Class B2	DIN 4102/part 1

Application

Application Details

Substrate Quality

In-situ concrete:
Clean, sound and dry, homogeneous, free from oils and grease, dust and loose or friable particles.
Shotcrete:
The profile of the shotcrete surface must be more than a ratio of length to depth of 15:1, the difference in depth within the locally neighboring higher and deeper points shall not be more than 20 cm related to the tunnel axis, the radius of the uneven neighboring parts shall be at least 5 times the difference in depth (higher and deeper locally neighboring points).
The shotcrete surface must not contain broken aggregates. Any leaks shall be sealed with Sika® waterproof plugging mortar, or drained with Sika® FlexoDrain.
Where necessary to achieve the desired profile/surface, apply a fine sprayed concrete layer on the shotcrete surface with a min. thickness of 5 cm and aggregate diameter not exceeding 4 mm. Steel (girders, reinforcement mesh, anchors, etc.) must also be covered with a minimum 5 cm of fine sprayed concrete.
The surface of the shotcrete and fine sprayed concrete must be cleaned (no loose stones, nails, wires, etc.).

Application Conditions / Limits

Substrate Temperature

0°C min. / +35°C max
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Ambient Air Temperature

+5°C min. / +35°C max.
For installation below +5°C ambient temperature, special measures for safety requirements may be required in accordance with relevant national regulations.

Ambient max. Temperature of Liquids

+35°C (water)

Application Instructions

Application Method / Tools

Installation method:
Loose laid and mechanically fastened, or loose laid and ballasted in accordance with the separate Sika Method Statement for sheet waterproofing membrane installations.
All membrane overlaps must be welded i.e. using automatic wedge-welding machines with individually adjustable and electronically controlled welding parameters (e.g. Leister Twinny T, Leister Comet). Details can be done using extruders or hand welding guns (e.g. Leister Triac PID).
Welding parameters, such as speed and temperature must be established with trials on site, prior to any welding works.

Construction

Notes on Application / Limits	Installation works shall only be carried out by Sika® trained contractors, experienced in the lining of tunnels and underground structures. The watertightness of the structure must be tested and approved after completion of the membrane installation works according to the requirements of the client's specifications. Sikaplan® WT 2260-15 HL is not suitable at exposure to permanent ground water temperature exceeding +35°C. The membrane is not UV stabilised and cannot be installed on structures permanently exposed to UV light and weathering.
Value Base	All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.
Health and Safety Information	This product is an article within the meaning of Article 3.3 of Regulation (EC) No. 1907/2006. A safety data sheet following EC- Regulation 1907/2006, article 31 is not needed to bring the product to the market to transport or use it. The product does not damage the environment when used as specified.
Protective Measures	Fresh air ventilation must be ensured, when working (welding) in closed rooms. Local safety regulations must be observed.
Legal Notes	The information, and in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users should always refer to the most recent issue of the Technical Data Sheet for the product concerned, copies of which will be supplied on request. www.sika.se.

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