

# Sikaplan® WP 1100-20HL

## Sheet Waterproofing Membrane – Tunnel / Basement

**Product Description** Sikaplan® WP 1100-20HL is a homogenous sheet waterproofing membrane with a 0.6mm thick signal layer, based on polyvinyl chloride (PVC-P). Suitable for use in hot and tropical climatic conditions.

**Uses** Sikaplan® WP 1100-20HL is a sheet waterproofing membrane for use in tunnels, basements and other underground structures.

- Characteristics / Advantages**
- Resistant to ageing
  - Optimised tensile strength and elongation
  - UV-stable (350MJ/m<sup>2</sup> acc. To EN 12224)
  - Resistant to root penetration
  - Dimensional stable
  - Without DEPH (DOP) plasticiser, based on virgin material
  - Flexible in cold temperatures
  - Heat Weldable
  - Can be installed on wet substrates
  - Suitable for contact with acidic soft water (low pH aggressive to concrete)
  - High water vapour transmission ability
  - Not bitumen resistant

### Tests

**Standards / Approvals** Product Declaration EN 13491 – Geosynthetic barriers – Characteristics required for use as a fluid barrier in the construction of tunnels and underground structures. CE-Certificate No. 1349-CPD-028.

### Product Data

**Form** Homogeneous rolled sheet membrane

**Appearance / Colour**

Surface:	Smooth
Colours:	Top layer: Yellow (signal layer)
	Bottom layer: Dark grey

**Packaging**

Roll size:	2.20 m (roll width) x roll length individual as specified
Unit weight:	2.60 kg/m <sup>2</sup>

### Storage

**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 and ice, etc.  
Do not stack pallets of rolls during transport or storage.

**Shelf Life** Product does not expire if correctly stored.



## Technical Data

<b>Chemical Base</b>	Polyvinyl Chloride (PVC-P)	
<b>Thickness</b>	2.0 mm (-5/+10%)	EN 1849-2
<b>Mass per Unit Area</b>	2.60 kg/m <sup>2</sup> (-5/+10%)	EN 1849-2
<b>Water Permeability</b>	< 10 <sup>-7</sup> m <sup>3</sup> x m <sup>-2</sup> x d <sup>-1</sup> (liquid tightness)	EN 14150:2001
<b>Tensile Strength</b>	Machine: 17.0 N/mm <sup>2</sup> (± 2.0) Cross: 16.0 N/mm <sup>2</sup> (± 2.0)	ISO R 527 – 1/3/5 ISO R 527 – 1/3/5
<b>Tear Strength</b>	Machine: ≥42 kN/m Cross: ≥42 kN/m	ISO 34 Method B; V=50 mm/min ISO 34 Method B; V=50 mm/min
<b>Elongation</b>	Machine: ≥ 300% Cross: ≥ 280%	ISO R 527 – 1/3/5 ISO R 527 – 1/3/5
<b>Burst Strength</b>	≥ 50%	EN 14151 D=1,0 m
<b>Static Puncture</b>	2.35 (± 0.25) kN	EN ISO 12236
<b>Low Temperature Behaviour</b>	≤ - 20 °C	EN 495-5
<b>Thermal Expansion</b>	190 x 10 <sup>-6</sup> (±50x10 <sup>-6</sup> ) 1/K	ASTM D 696-91
<b>Weathering</b>	Remaining tensile strength and elongation: ≥ 75%	EN 12224, 350 MJ/m <sup>2</sup> ISO 527-3/5/100
<b>Micro Organism</b>	Change of tensile strength: ≤ 15% Change in elongation: ≤ 15 %	EN 12225; ISO 527-3/5 EN 12225; ISO 527-3/5
<b>Oxidation</b>	Change of tensile strength: ≤ 25% Change in elongation: ≤ 25%	EN 14575; ISO 527-3/5 EN 14575; ISO 527-3/5
<b>Environmental Stress Cracking</b>	This method of testing is only suitable for flexible polyolefin (FPO) based materials.	ASTM D 5397-99 (EN 14576)
<b>Chemical Resistance</b>	A (hydrolyses under acid conditions): Change in elongation: ≤ 10% B (hydrolyses under alkaline conditions): Change in elongation: ≤ 10% D (artificial disposal water): Change in elongation: ≤ 10%	EN 14414: 2004-08; ISO 527-3/5 EN 14414: 2004-08; ISO 527-3/5 EN 14414: 2004-08; ISO 527-3/5
<b>Resistance to Root Penetration</b>	Pass	EN 14416:2002
<b>Reaction to Fire</b>	Class E	EN ISO 11925-2
<b>Behaviour under Hydrostatic Pressure</b>	5 bar / 72hr (10 bar / 24hr) No leakage	EN 1928 (DIN 16726-5.11)
<b>Thermal Ageing</b>	(70 d / 70 °C) Change of weight: ≤ 2.0% Change of tensile strength: ≤ 20% Change of elongation: ≤ 20%	EN 1296 (SIA V280-8)
<b>Elastic Modulus E<sub>1-2</sub></b>	Machine and cross direction: ≤ 20 N/mm <sup>2</sup>	ISO 527-1/3
<b>Heat Distortion Dimensional Stability</b>	6hr / 80 °C Machine and cross direction: ≤ 2.0% Behaviour after heat exposure: No blisters	EN 1107-2 (SIA V280-4; DIN 16726-5.13)

<b>Impact Resistance</b>	(500 g) No leakage at 750 mm	EN 1107-2 (SIA V280-4; DIN 16726-5.12)
<b>Long Term Compression Strength</b>	No leakage at 7 N/mm <sup>2</sup> , (50hr)	SIA V280-14
<b>Behaviour after Storage in Warm Water</b>	8mt / 50 °C Change of weight: ≤ 4.0% Change of tensile strength: ≤ 20% Change of elongation: ≤ 20%	EN 1296 (SIA V280-13)
<b>Behaviour after Storage in Aqueous Solutions</b>	(28 d / 23 °C), H <sub>2</sub> SO <sub>3</sub> (5%); Ca(OH) <sub>2</sub> (sat.); NaCl (10%) Change of tensile strength: ≤ 15% Change of elongation: ≤ 15%	EN 1847 (SIA V280-18; DIN 16726-5.18)
<b>Behaviour of Welding</b>	Tensile shearing test: Break outside the welding seam Short time welding factor: fz = ≥ 0.6 Peeling resistance: ≥ 6 N/mm	EN 12317-2 EN 12316-2

## Application Details

<b>System Structure</b>	Ancillary products: <ul style="list-style-type: none"> <li>- Sikaplan® WP Disc for fixing pieces</li> <li>- Sikaplan® W Felt PP</li> <li>- Sikaplan® W Tundrain Typ A</li> <li>- Sikaplan® WP Protection sheet</li> <li>- Sika® Waterbars WP, Types AR and DR for fixing pieces and waterproofing concrete joints</li> </ul>	
<b>Substrate Quality</b>	<i>In-situ concrete:</i> Clean, sound and dry, homogeneous, free from oils and grease, dust and loose or friable particles.  <i>Shotcrete:</i> The profile of the shotcrete surface must not exceed a ratio of length to depth of 5:1 and its min. radius must be 20 cm. The shotcrete surface must not contain broken aggregates. Any leaks shall be sealed with Sika® waterproof plugging mortars, 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.).	
<b>Substrate Temperature</b>	0°C min. / +35°C max.	
<b>Ambient Temperature</b>	+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.	
<b>Ambient Temperature of Liquids</b>	+30°C maximum	
<b>Application Method / Tools</b>	Installation method: Loose laid and mechanically fastened, or loose laid and ballasted in accordance with the separate Sika® Method Statement and Application Manual for sheet waterproofing membrane installations.  All membrane overlaps must be heat welded i.e. using hand welding guns and pressure rollers or automatic heat welding machines, with individually adjustable and electronically controlled welding temperatures (such as the manual Leister Triac PID / automatic: Leister Twinny S / semi-automatic: Leister Triac Drive). Use Sika-Trocal® Cleaner 2000 for seam preparation and cleaning of slightly soiled membrane surface.  Welding parameters, such as speed and temperature must be established with trials on site, prior to any welding works.	

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**Notes on Application /  
Limitations**

Installation works shall only be carried out by Sika® trained contractors, experienced in the lining of tunnels and underground structures.

The membrane is not resistant to permanent contact with materials including bitumen, and plastics other than PVC; on these it requires a separation layer of geotextile (> 300 g/m<sup>2</sup>).

**Sikaplan® WP 1100 – 20HL** is not suitable as sheet waterproofing membrane for tunnels, when exposed to permanent water temperature exceeding + 30°C and when exposed to polluted, or waste waters. It can be exposed temporary to ground water or polluted water with temperature up to 50°C for 3 months.

The water tightness of the structure must be approved after completion of the membrane installation works according to the requirements of the client's specifications.

The membrane is not UV stabilised and must not be installed on structures where it is permanently exposed to UV light and weathering. It can be exposed temporary to UV light up to 6 months.

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<b>Value Base</b>	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.
<b>Local Restrictions</b>	Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the product uses.
<b>Health and Safety Information</b>	For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.
<b>REACH</b>	<p><b>European Community Regulation on chemicals and their safe use (REACH: EC 1907/2006)</b></p> <p>This product is an article within the meaning of Regulation (EC) No 1907/2006 (REACH). It contains no substances which are intended to be released from the article under normal or reasonably foreseeable conditions of use. Therefore, there are no registration requirements for substances in articles within the meaning of Article 7.1 of the Regulation.</p> <p>Based on our current knowledge, this product does not contain SVHC (substances of very high concern) from the candidate list published by the European Chemicals Agency in concentrations above 0.1 % (w/w).</p>
<b>Protective Measures</b>	Fresh air ventilation must be ensured, when working (welding) in closed rooms. Local safety regulations must be observed.
<b>Transportation Class</b>	The product is not classified as hazardous good for transport.
<b>Disposal</b>	The material is recyclable. Disposal must be according to local regulations.
<b>Legal Notes</b>	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 accordance with Sika's recommendations. 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 user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

All products are manufactured under a management system certified to conform to the requirements of the quality, environmental and occupational health & safety standards ISO 9001, ISO 14001 and OHSAS 18001.



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