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Agrément Certificate
15/5218
Product Sheet 1

SIKA WATERPROOFING MEMBRANES

SIKAPLAN WP 1100-21 HL AND SIKAPLAN WP 1100-21 HL2

This Agrément Certificate Product Sheet(1) relates to Sikaplan(2) WP 1100-21 HL and Sikaplan WP 1100-21 HL2, for use as a damp-proofing and waterproofing membranes for solid concrete floors, tunnels and underground structures and for internally and externally applied tanking below ground.

(1) Hereinafter referred to as 'Certificate'.
(2) Sikaplan is a registered trademark.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Resistance to water and water vapour — the products, including joints, will provide an effective barrier to the passage of water under hydrostatic pressure and water vapour from the ground (see section 6).

Resistance to mechanical damage — the products will accept, without damage, the limited foot traffic and loads associated with installation and will accommodate the movements likely to occur under normal service conditions (see section 7).

Durability — under normal service conditions the products will provide an effective barrier to the transmission of moisture for the life of the structure in which it is incorporated (see section 9).

The BBA has awarded this Certificate to the company named above for the product described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

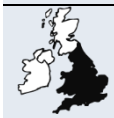
Date of Fourth issue: 28 March 2022

Originally certificated on 22 May 2015.

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, Sikaplan WP 1100-21 HL and Sikaplan WP 1100-21 HL2, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	**C2(a)**	**Resistance to moisture**
Comment:		The products, including joints, will enable a structure to satisfy this Requirement. See section 6 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The products are acceptable. See section 9 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)**	**Durability, workmanship and fitness of materials**
Comment:		The products satisfy the requirements of this Regulation. See section 9 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	3.4	Moisture from the ground
Comment:		The products will enable a floor to satisfy the requirements of this Standard, with reference to clauses 3.4.1(1)(2), 3.4.2(1)(2), 3.4.5(1)(2), 3.4.6(1)(2) and 3.4.7(1)(2). See section 6 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The products can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		All comments given for the products under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1(1)(2) and Schedule 6(1)(2).

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	**23(a)(i) (iii)(b)(i)**	**Fitness of materials and workmanship**
Comment:		The products are acceptable. See section 9 and the *Installation* part of this Certificate.
Regulation:	**28(a)**	**Resistance to moisture and weather**
Comment:		The products will enable a floor to satisfy this Regulation. See section 6 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: 1 *Description* (1.2) of this Certificate.

Additional Information

NHBC Standards 2022

In the opinion of the BBA, Sikaplan WP 1100-21 HL and Sikaplan WP 1100-21 HL2, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 5.1 *Substructure and ground bearing floors* (for use below the slab and in sandwich constructions) and Chapter 5.4 *Waterproofing of basements and other below ground structures* (for use as part of an external basement tanking system).

Where Grade 3 protection is required and the below ground wall retains more than 600 mm measured from the top of the retained ground to the lowest finished floor level, the product must be used in combination with either a Type B or C waterproofing protection.

CE marking

The Certificate holder has taken the responsibility of CE marking the products in accordance with harmonised European Standard BS EN 13967 : 2012 and BS EN 13491 : 2004.

Technical Specification

1 Description

1.1 Sikaplan WP 1100-21 HL is a homogeneous polyvinyl chloride (PVC-P) sheet waterproofing membrane with a yellow top surface, a 0.6 mm thick signal layer, and a dark grey bottom surface, a 1.5 mm thick layer, to provide an overall thickness of 2.1 mm.

1.2 Sikaplan WP 1100-21 HL2 is a homogeneous polyvinyl chloride (PVC-P) sheet waterproofing membrane with a yellow top surface, a 0.2 mm thick signal layer, and a dark grey bottom surface, a 1.9 mm thick layer, to provide an overall thickness of 2.1 mm.

1.3 The products have the following nominal characteristics:

Thickness (mm)	2.1
Length (m)	20.0
Mass per unit area ($kg \cdot m^{-2}$)	2.74
Width (m)	2.2
Roll weight (kg)	approximately 120
Watertightness	Pass
Tear resistance (N)	≥ 500
Joint strength (N per 50 mm)	≥ 1100
Resistance to impact (mm)	≥ 750
Tensile strength ($N \cdot mm^{-1}$)	
MD	≥ 15
CD	≥ 14
Resistance to static loading (kN)	≥ 2.35.

1.4 Ancillary items for use with the products, but outside the scope of this Certificate, include:

- Sikaplan WP Protection Sheet — used to protect the membrane against mechanical damage
- geotextile (minimum 500 $g \cdot m^{-2}$) separation layer — for use on hard substrates
- Sikaplan WP Laminated Metal Strip F 100 — for linear fixing of the membrane
- Sikaplan WP Disc — for spot fixing of the membrane

- Sika Waterbar – for creating compartments and linear fixings
- Sika Dilatec, type E / ER joint sealing tapes – surface applied joint sealing tape
- Sikaplan WP Tape-200 – termination, fixing and sealing tape
- Sikaplan WP Trumpet Flange – preformed flange in trumpet shape
- Sikaplan WP Control Socket – preformed injection flange
- Sarna Cleaner — solvent-based cleaner for preparation of the membrane surface prior to welding
- Sika-Trocal Cleaner 2000 — solvent-free cleaner for preparation of the membrane surface prior to welding.

2 Manufacture

2.1 The membranes are manufactured by conventional manufacturing processes of mixing, extrusion and calendering.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by SQS (Certificate 31982).

3 Delivery and site handling

3.1 The products are delivered to site in rolls wrapped in polythene film with a self-adhesive label bearing the Certificate holder's name and traceability information. The rolls have a shelf life of 5 years from the date of production.

3.2 The rolls should be stored in a horizontal position, in dry conditions and at temperatures between 5 and 35°C. They must be protected from direct sunlight, rain, snow and ice.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Sikaplan WP 1100-21 HL and Sikaplan WP 1100-21 HL2.

Design Considerations

4 Use

4.1 Sikaplan WP 1100-21 HL and Sikaplan WP 1100-21 HL2 are satisfactory for use as a damp-proofing and waterproofing membrane for solid concrete floors, tunnels and underground structures, and for internally and externally applied tanking below ground in accordance with the relevant clauses of CP 102 : 1973 Section 3, and all grades of basement constructions as defined in Table 2 of BS 8102 : 2009, provided it is fully supported and protected.

4.2 The products are compatible with concrete, shotcrete, smooth brickwork and blockwork and screeded substrates, and is resistant to those chemicals likely to be present in normal service conditions. Care must be taken to prevent contact with hydrocarbons.

4.3 A geotextile (minimum 500 $g \cdot m^{-2}$) separation layer must always be used between the substrate and the products.

4.4 The products must always be fully protected immediately after installation, in accordance with the Certificate holder's instructions.

5 Practicability of installation

The products should only be installed by installers who have been trained and approved by the Certificate holder.

6 Resistance to water and water vapour

The products, including joints, when completely sealed and consolidated, will adequately resist the passage of water under hydrostatic pressure and moisture from the ground into the structure and will enable a structure to comply with the requirements of the national Building Regulations.

7 Resistance to mechanical damage

7.1 The products can accept the limited foot traffic and light loads associated with installation and maintenance.

7.2 When installed, the membranes are capable of accommodating the minor movements likely to occur under normal service conditions.

7.3 The membranes can be damaged by sharp objects, and care should be taken particularly when the membranes are exposed during construction and back filling or screeding operations.

7.4 Where damage does occur, the membranes must be repaired (see section 12).

8 Maintenance

As the products are confined and have suitable durability, maintenance is not required. However, damage occurring during installation must be repaired in accordance with section 12 prior to concrete placement.

9 Durability

The products, when fully protected and subjected to normal service conditions, will provide an effective barrier to the transmission of water and water vapour for the life of the structure in which it is incorporated.

Installation

10 General

10.1 Sikaplan WP 1100-21 HL and Sikaplan WP 1100-21 HL2 must be installed in accordance with the relevant requirements of BS 8102 : 2009, BS 8000-0 : 2014, BS 8000-4 : 1989, CP 102 : 1973 Section 3, this Certificate and the Certificate holder's instructions.

10.2 Concrete, shotcrete or screeded surfaces must have a smooth and uniform finish and be dry and free from loosely adhering material, sharp protrusions, dust, oil and grease.

10.3 Vertical surfaces of brickwork, blockwork and, if necessary, masonry should be rendered to provide an even surface. Brickwork or blockwork not rendered must be flush pointed to give a smooth surface without sudden changes in level.

10.4 Sikaplan WP 1100-21 HL and Sikaplan WP 1100-21 HL2 are not resistant to permanent contact with materials including bitumen and plastics other than PVC, and will require a separation layer of non-woven geotextile (minimum 150 $g \cdot m^{-2}$).

10.5 The membranes are not UV stabilised and cannot be installed on structures permanently exposed to UV light and weathering.

10.6 Installation should not be carried out during inclement weather (eg rain, fog or snow). When the temperature is below 5°C, suitable precautions against surface condensation must be taken.

10.7 Sikaplan WP 100-21 HL and Sikaplan WP 1100-21 HL2 must be protected against hard substrates with a non-woven geotextile (minimum 500 g·m^{-2}) separation layer.

10.8 The geotextile must be loose-laid and mechanically fixed using Sikaplan WP Laminated Metal Strip F 100 or Sikaplan WP Disc, with overlaps of a minimum of 80 mm in accordance with the Certificate holder's instructions.

10.9 The membranes are spot heat welded to the Sikaplan WP Laminated Metal Strip F 100 or Sikaplan WP Disc.

10.10 All membrane overlaps must be welded by using an automatic heat welding machine with controlled welding temperatures, in accordance with the Certificate holder's instructions.

10.11 The integrity of the overlaps must be checked in accordance with the Certificate holder's instructions.

10.12 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 specification.

10.13 Sikaplan WP Protection Sheet must be used to prevent damage to the membrane.

10.14 For all existing details, such as pipe penetrations, shaft connections, pits, pile heads, expansion joints and any other details, the Certificate holder's advice must be sought.

11 Procedure

Waterproofing termination details

11.1 The membranes must be terminated a minimum of 1.0 m above the maximum groundwater level and/or a minimum of 0.15 m above ground level. If the height of vertical waterproofing does not exceed 4.0 m, it may be linear-fixed at terminations at the top of loose-hanging membranes (with the exception of compartment systems with waterstops). Waterproofing which exceeds 4.0 m high requires intermediate linear or spot fixings at maximum vertical distances of 2.0 m.

Fixings on vertical areas with Sikaplan WP Laminated Metal Strip F 100

11.2 Sikaplan WP Laminated Metal Strip F 100 (size 100 x 2000 mm with mounting holes of 5 mm diameter at 150 mm centres) must be fixed horizontally and at a vertical distance of maximum 2.0 m on the loose-hanging geotextile, leaving a gap of 5 mm between each strip. The strips must be fixed with countersunk screws (diameter 4.5 mm/length 20 mm, stainless steel) and dowels into reinforced concrete. The gaps between the profiles must be covered with 20 mm adhesive tapes. The profiles must not cross expansion joints.

Spot fixing with Sikaplan WP Disc on shotcrete

11.3 The membrane and geotextile separation layer is fixed to shotcrete or concrete using Sikaplan WP Disc, with a nail gun (for shotcrete) or dowels inserted into pre-drilled holes (for concrete), using a minimum of two fixings per 2 m both horizontally and vertically.

Vertical waterproofing

11.4 Surfaces of geotextiles, mounted metal profiles etc must be checked for loose debris or sharp projections prior to membrane installation. The membrane is unrolled and installed vertically on walls according to the chosen fixing method, ie PVC-laminated metal strips/profiles or heat-welding on laminated metals.

11.5 The membrane is cut to the approximate size required, with minimum overlaps of 80 mm, and fixed with the chosen fixing method at terminations and at intermediate fixing points on the wall. This is repeated with the next roll of membrane, and vertical overlaps are heat-welded from the bottom to the top. The installed membrane is welded at prepared details, eg around penetrations.

Horizontal waterproofing

11.6 Surfaces of geotextiles and mounted metal profiles etc must be checked for loose debris and sharp projections prior to membrane installation.

11.7 The membrane is cut to the approximate size required, with allowance made for 80 mm overlaps. The cut section is unrolled, placed in position and temporarily ballasted, eg with sandbags, and the process is repeated with the next sheet.

Welding methods

11.8 Welding machine operators must be trained and experienced in heat-welding technology according to local regulations.

11.9 Sikaplan WP 100-21 HL and Sikaplan WP 1100-21 HL2 must be welded by using suitable heat-welding machines.

11.10 Seam overlaps of membrane must in all cases be at least 80 mm, and the width of the finished welded seam (single or double seam) must be at least 30 mm.

11.11 Before welding commences, the membrane surfaces must be dry, clean, and free from dust, oil, grease and other contaminants. If contaminated, the membrane can be cleaned using Sarna Cleaner or Sika-Trocal Cleaner 2000.

11.12 Prior to any heat-welding work a welding test must be conducted on a specimen of membrane, in order to adjust the welding temperature and speed of the machine.

Testing of welded seams

11.13 All welded seams must be tested for water-tightness. Testing methods depend on available testing equipment and/or the client's specification.

11.14 Correctly heat-welded single seams show a continuous welding 'rope' at seam edge. The finished seam should be checked by running a screwdriver head along the seam applying slight pressure, and visually checking for irregular or interrupted rope which can be the sign of voids or capillaries in the seam.

11.15 Any voids or capillaries must be rectified using a hand-held welding gun and 20 mm silicone roller.

11.16 All double seams must be tested with a compressed air testing kit, and any leaks repaired by heat welding a patch of membrane over the defective area, using a hand-held welding gun and 20 mm silicone roller.

Detailing and service penetrations

11.17 Consideration must be given to detailing and all service penetrations in tanking installations. The advice of the Certificate holder must be sought.

12 Repair

12.1 Any damage to the products can be sealed on the internal side of the membrane by heat-welding the product, overlapped by at least 80 mm.

12.2 Any repairs to the products must be done prior to concrete placement. The advice of the Certificate holder must be sought.

Technical Investigations

13 Tests

13.1 Tests were carried out and the results assessed to determine:

- thickness and mass per unit area
- length, width and straightness
- visible defects
- watertightness
- watertightness of joints
- resistance to impact
- dimensional stability
- tear resistance
- joint strength
- water vapour transmission
- resistance to static loading
- resistance to static puncture
- tensile strength and elongation at break
- low temperature flexibility
- watertightness after heat ageing at 70°C for 12 weeks and after water exposure at 60°C for 7 days
- tear resistance after heat ageing at 70°C for 12 weeks and after exposure to alkali at 23°C for 28 days
- joint strength after heat ageing at 70°C for 12 weeks and after water exposure at 60°C for 7 days
- tensile strength and elongation at break after heat ageing at 70°C for 70 days.

13.2 An evaluation of existing independent test data was carried out in relation to:

- water permeability
- burst strength
- resistance to oxidation
- resistance to environmental stress cracking.

14 Investigations

14.1 An evaluation of a site in progress was made to assess the practicability of installation.

14.2 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*
BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS 8102 : 2009 *Code of practice for protection of below ground structures against water from the ground*

BS EN 13491 : 2004 + A1:2006 *Geosynthetic barriers — Characteristics required for use as a fluid barrier in the construction of tunnels and underground structures*

BS EN 13967 : 2012 + A1 : 2017 *Flexible sheets for waterproofing — Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet — Definitions and characteristics*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

15 Conditions

15.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

15.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

15.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

15.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

15.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

15.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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