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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

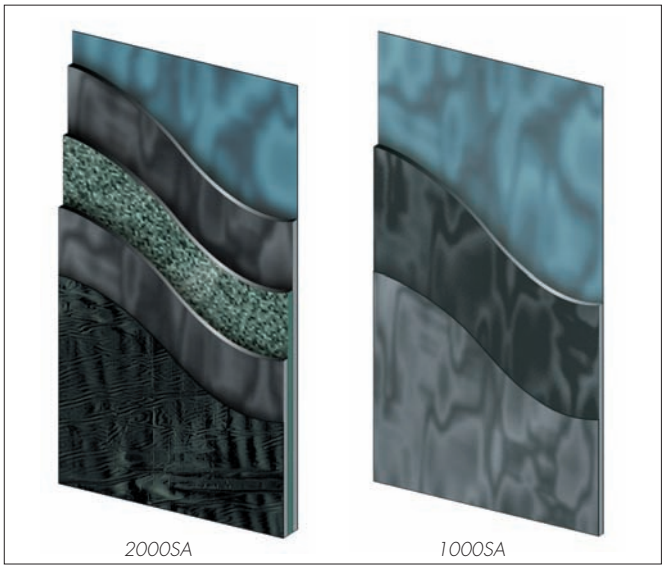
Agrément Certificate
98/3479
Product Sheet 2

HYLOAD TANKING MEMBRANES

HYLOAD 1000SA AND 2000 SA

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Hyload 1000SA and 2000SA, for use as damp-proof and waterproof membranes for solid concrete floors and underground structures, and for use as internally and externally applied tanking below ground.



AGRÉMENT 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 investigation
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Resistance to water and water vapour — the products will resist the passage of moisture to the interior of the building (see section 5).

Resistance to puncture — the products will accept the limited foot traffic and loads associated with installation and maintenance of the system without damage (see section 6).

Adhesion and stability — the adhesion of the products to the substrate and to themselves is satisfactory (see section 7).

Effects of temperature — the products remain flexible and can be formed at the minimum recommended temperatures (see section 8).

Durability — under normal service conditions the products will provide an effective barrier to the transmission of liquid water and water vapour for the life of the structure in which they are incorporated (see section 10).

The BBA has awarded this Agrément Certificate to the company named above for the products described herein. The 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 First issue: 28 May 2009

Originally certificated on 22 September 1998

Simon Wroe
Head of Approvals — Materials

Greg Cooper
Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Hyload 1000SA and 2000SA, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:

The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	C2(a)	Resistance to moisture
Comment:		Data for water resistance on the products, including joints, indicate that the products meet this Requirement. See section 5 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable. See section 10 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The use of the products can satisfy the requirements of this Regulation. See sections 9 and 10 and the *Installation* part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	3.4	Moisture from the ground
Comment:		Data for water resistance on the products, indicate that the use of the products will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.4.2[1][2] and 3.4.5[1][2] to 3.4.7[1][2]. See section 5 of this Certificate.
Regulation:	12	Building standards — conversions
Comment:		All comments given for these products under Regulation 9, 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) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The products are acceptable. See section 10 and the *Installation* part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The products do not normally require maintenance. See section 9 of this Certificate.
Regulation:	C4(a)	Resistance to ground moisture and weather
Comment:		Data for water resistance on the products indicate that the use of the system will enable a roof to satisfy the requirements of this Regulation. See section 5 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 *Description* (1.2) and 2 *Delivery and site handling* (2.3).

NHBC Standards 2008

NHBC accepts the use of Hyload 1000SA and 2000SA, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 5.1 *Substructure and ground bearing floors*.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Hyload 1000SA and 2000SA, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 3 *Substructure*, Sub-section *dpc and dpm*.

Technical Specification

1 Description

1.1 Hyload 1000SA and 2000SA are two-ply, self-adhesive, damp-proof membranes comprising a top layer of high-performance, high-density polyethylene (PE-HD) bonded to a layer of bitumen/polymer adhesive carried on a release liner.

1.2 The nominal characteristics for the membranes are shown in Table 1.

Table 1 Nominal characteristics

Characteristics (units)	1000SA	2000 SA
Thickness (mm)	1.5	2.0
Width (m)	1.0	1.0
Roll length (m)	20	15
Roll weight (kg)	32	30
Mass per unit area (kgm^{-2})	1.6	2.0

- IKOpro SA Bitumen Primer — a cold-applied bituminous primer consisting of a special blend of bitumens, solvents and additives for preparing substrates prior to application
- Hyload Protection Board — a flexible polymeric board for protecting the tanking membranes against mechanical damage, pedestrian or vehicular traffic and damage caused by backfilling
- Hyload Preformed Shapes — a range of preformed angles, corners, for detailing work.

1.4 Quality control on the final product includes checks on the following properties:

- softening point of adhesive bitumen compound
- penetration of adhesive bitumen compound
- release properties of siliconised liner.

2 Delivery and site handling

2.1 Rolls of Hyload 1000SA and 2000SA are packed in cardboard boxes. The packaging bears the marketing company's name, product name, batch number and the BBA identification mark, incorporating the number of this Certificate.

2.2 The rolls must be stored in dry conditions under cover, and upright in the original cardboard boxes.

2.3 If stored in accordance with section 2.2 the shelf-life of the membranes will be 12 months.

2.4 IKOpro SA Bitumen Primer is classified under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002* (CHIP3) as 'flammable[1]', 'harmful' and 'dangerous to the environment' and should be stored appropriately. The product container bears the appropriate hazard warnings.

(1) The products should be stored in accordance with the *Highly Flammable Liquids and Liquefied Petroleum Gases Regulations* (1972).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Hyload 1000SA and 2000SA.

Design Considerations

3 General

3.1 Hyload 1000SA and 2000SA are satisfactory for use as damp-proof and waterproofing membranes under concrete screed and floor slabs and internally and externally-applied tanking below ground, in accordance with the relevant Clauses of CP 102 : 1973, Section 2 or BS 8102 : 1990, provided they are fully supported and protected.

3.2 The membranes are compatible with concrete, smooth brickwork and blockwork or screeded substrates and are resistant to those chemicals likely to be present in normal service conditions.

4 Practicability of installation

The products are designed to be installed by contractors, experienced with these types of products.

5 Resistance to water and water vapour

Test data examined confirm that the products, and joints in the membranes, when completely sealed and consolidated, will adequately resist the passage of moisture from the ground and so meet the requirements of national Building Regulations (see section 14, Table for *Physical properties — general*):

England and Wales — Approved Document C, Requirement C2(a), Sections 4.7 and 5.5.

Scotland — Standard 3.4, clauses 3.4.2and 3.4.5 to 3.4.7

Northern Ireland — Regulation C4(a).

6 Resistance to puncture

6.1 Membranes can be punctured by sharp objects and care should be taken in handling building materials and equipment over the exposed surface. See section 14, Table for *Physical properties — general*.

6.2 Provided there are no sharp objects present on the membrane surfaces prior to and during installation of the protective layer, the products will not be damaged by normal foot traffic. If damaged, repairs can be carried out by patching prior to application of the protection.

7 Adhesion and stability

Test data indicate that the adhesion of the membranes to the substrate and to themselves, jointed as described in this Certificate, is satisfactory. The properties of the membranes accommodate minor movements likely to occur under normal service conditions in the structure in which they are incorporated. See section 14, Table for *Physical properties — general*.

8 Effects of temperature

8.1 The membranes remain flexible and capable of being formed at the minimum recommended temperatures. See section 14, Table for *Physical properties — general*.

8.2 When installed the membrane should not achieve temperatures at which slippage due to softening of the adhesive layer can occur.

9 Maintenance

As the products are either, protected by a wall, backfill or screed and they have suitable durability (see section 10), maintenance is not required. However, it must be ensured that damage occurring prior to installation of the protection is repaired (see section 13).

10 Durability

The products, when fully protected and subjected to normal service conditions, will provide an effective barrier to the transmission of liquid water and water vapour for the life of the structure in which they are incorporated. See section 14, Tables for *Physical properties — directional* and *Physical properties — general*.

Installation

11 General

11.1 Hyload 1000SA and 2000SA must be installed in accordance with the relevant requirement of CP 102 : 1973, Section 2 or BS 8102 : 1990 and the manufacturer's instructions. Additional guidance on the use of dpm materials is available in BS 8000-4 : 1989.

11.2 All surfaces to which the products are to be applied should have a smooth finish, ie they should be free from cavities, projections and mortar deposits. Surfaces should be dry and free from dust and frost. Concrete surfaces should be dense. Surfaces should be primed with IKOpro SA Bitumen Primer, at the recommended coverage rate, and allowed to dry.

11.3 Vertical surfaces of brickwork and blockwork should be dry and, preferably, 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.

11.4 The products can be installed in all normal site conditions provided the air temperature is not below 5°C to prevent the risk of surface condensation.

11.5 The membranes should be covered by a screed or other protective layer as soon as possible after installation. If blockwork protection is used, care must be taken to avoid damage to the membrane during construction.

11.6 Provided sharp objects are not present prior to and during installation of the protective layer, the membranes will not be damaged by normal foot traffic.

11.7 A 330 mm strip of Hyload tanking membrane should be placed at all angles/changes of direction (such as the junction of horizontal and vertical surfaces and corners), and at the top where the membrane meets the dpc. Suitable fillets and splays should be used.

12 Procedure

12.1 The release liner is removed prior to applying the membrane to the prepared substrate. In all cases, as the sheet is laid, the membrane must be pressed firmly from the middle to prevent trapping air.

12.2 Overlaps must be 100 mm. The surface to be overlapped should be dust free and to ensure a watertight bond the membrane should be firmly pressed down.

Solid concrete floors

12.3 It is essential that the damp-proof membrane in the floor should be continuous with the damp-proof course in the surround walls. This is achieved by continuing the membrane up internal wall surfaces to tie in with the damp-proof course. A sand/cement screed should be laid immediately after the installation to prevent damage.

External tanking

12.4 When the foundation block extends beyond the concrete structure the membrane should be applied to the horizontal surface and extended up the outer face of the wall and cut into it.

12.5 A protection wall of brickwork, blockwork or protection board should be used against all the membranes to protect them against puncture during backfilling, or subsequently by the backfill.

Internal tanking

12.6 The membrane should be applied to the site concrete base as well as to the interior face of the external wall. It should be tucked into the dpc and applied down the wall and 300 mm onto the site concrete base.

12.7 The products are applied to the walls to achieve the overlaps defined in section 12.2. A wall (preferably concrete) should be applied immediately after installation to protect the damp-proof membrane and to resist the action of external water pressure. Where brickwork or blockwork is used it should be set 40 mm away from the membrane to enable the space so formed to be thoroughly filled with a sand/cement mortar.

13 Repair

Damage to the products can be adequately repaired by patching prior to the application of protection or backfilling.

Technical Investigations

14 Tests

14.1 Samples of Hyload 1000SA and 2000SA were obtained from the manufacturer for testing. The results of the tests carried out by, or on the behalf of, the BBA, which show typical results for the material, are summarised in Tables 2 and 3.

Table 2 *Physical properties — directional*

Test (units)	Mean results				Method[1]
	1000SA		2000SA		
	Longitudinal	Transverse	Longitudinal	Transverse	
Tensile strength (N per 50 mm)					BS 2782-3.320A (100 mm min^{-1})
unaged	182	241	186	186	
heat aged[2]	218	284	—	—	
water soak[3]	187	237	—	—	
UV aged[4]	216	267	—	—	
Elongation at maximum load (%)					BS 2782-3.320A (100 mm min^{-1})
unaged	134	103	462	406	
heat aged[2]	160	106	—	—	
water soak[3]	152	103	—	—	
UV aged[4]	170	110	—	—	
Tear strength (trouser) (N)	49.8	59.4	29.1	49.4	BS 2782-3.360B
Tear resistance (nail) (N)	77.0	92.0	91.6	89.6	MOAT 27 : 5.4.1
Dimensional stability (%)	–0.25	0.40	—	—	MOAT 27 : 5.1.6.1

(1) The test documents are detailed in the *Bibliography*. Numbers/letters in the table refer to sections/parts of the various documents.

(2) Heat aged at 60°C for 56 days.

(3) Water soak 28 days at 23°C.

(4) UV aged for 500 hours UVB.

— not tested.

Table 3 Physical properties — general

Test (units)	Mean results		Method[1]
	2000 SA	MP	
Water vapour transmission ($gm^{-2}day^{-1}$)	—	0.23	BS 3177 (25°C/75% RH)
Water vapour resistance ($MNsg^{-1}$)	—	892	BS 3177 (25°C/75% RH)
Low temperature flexibility (°C)			MOAT 27 : 5.4.2
unaged	≤–20[2]	–25	
heat aged[3]	—	–25	
water soak[4]	—	–25	
UV aged[5]	—	–25	
Resistance to water pressure (6 m head)			MOAT 27 : 5.1.4
membrane	—	pass	
joints	pass	—	
Low temperature unrolling	—	pass	MOAT 27 : 5.4.3
Static indentation			MOAT 27 : 5.1.9
concrete substrate	L_2	L_4	
Dynamic indentation			MOAT 27 : 5.1.10
perlite substrate	I_1	I_2	
Substrate movement (cracking test)	—	pass	BBA method[6]
Tensile strength of joints (N per 50 mm)			MOAT 27 : 5.2.2
unaged	—	130.6[7]	
heat aged[8]	—	182.0[7]	
water soak[9]	—	133.0[7]	
Peel resistance (N)			MOAT 27 : 5.1.3
unaged	—	105.4[7]	
heat aged[8]	—	77.2[7]	
Vertical pull-off (Nmm^{-12})			BBA method[10]
control	—	0.24[7]	
heat aged[8]	—	0.31[7]	
Slippage (mm after 7 days)	—	5	MOAT 27 : 5.1.7

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the various documents.

(2) –20°C lowest temperature tested.

(3) Heat aged 56 days at 60°C.

(4) Water soak 28 days at 23°C.

(5) UV aged for 500 hours UVB.

(6) Method based on BE 27 Appendix B : Part C(iv).

(7) Cohesive failure of adhesive layer during test.

(8) Heat aged 28 days at 60°C.

(9) Water soak 7 days at 60°C.

(10) Method based on BE 27 Appendix B : Part C(vii).

— not tested.

14.2 The products were also tested for the following properties:

- ring and ball temperature
- thickness
- width
- weight per unit area.

15 Investigations

15.1 A factory inspection was carried out to access and examine the manufacturing process and quality control methods.

15.2 A site in progress was visited to examine the practicability of installation.

15.3 A user survey was carried out to investigate performance in use.

Bibliography

BS 2782-3.320A to 320F : 1976 *Methods of testing plastics — Mechanical properties — Tensile strength, elongation and elastic modulus*

BS 2782-3.360B : 1980 *Methods of testing plastics — Mechanical properties — Determination of tear strength of sheet and sheeting (trouser tear method)*

BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS 8102 : 1990 *Code of practice for protection of structures against water from the ground*

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

MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*

BE27 *Department of Transport Checks and Tests for the Approval of Waterproofing Systems for Concrete Decks to Highway Bridges (Superseded by BD 47)*

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

16.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.

16.4 In granting this Certificate, the BBA is not responsible for:

- 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
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

16.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

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