CI/SfB

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Agrément Certificate No 92/2817
*Second issue**

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

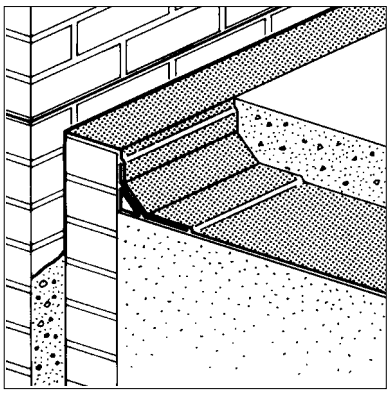
Designated by Government to issue European Technical Approvals

RIW SHEETSEAL MEMBRANES

Membrane d'étanchéité
Wasserdichtungsmittel

Product

- *THIS CERTIFICATE REPLACES CERTIFICATE No 87/1833 AND RELATES TO RIW SHEETSEAL, TWO-PLY, SELF-ADHESIVE WATERPROOFING MEMBRANES COMPRISING A TOP LAYER OF POLYETHYLENE FILM AND A BOTTOM LAYER OF BITUMEN/POLYMER ADHESIVE.*
- *The products are available in three grades, RIW Sheetseal 220, 223 and 226. All grades are supplied with a polyethylene protected selvedge strip.*
- *The products are for use as damp-proof and waterproof membranes for solid concrete floors, underground structures, etc and for internally and externally applied tanking below ground. RIW Sheetseal 226 is also UK WFBS listed for use in waterproofing reservoir roofs. The membranes must always be protected.*



Building Regulations

1 The Building Regulations 1991 (as amended 1994) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of damp-proof membranes with the Building Regulations. In the opinion of the BBA, RIW Sheetseal Membranes, if used in accordance with the provisions of this Certificate, will meet the relevant requirements.

Requirement:	C4	Resistance to weather and ground moisture
Comment:		Tests performed by the BBA indicate that the products will meet this Requirement. See section 7.1 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable materials. See section 11 of this Certificate.

2 The Building Standards (Scotland) Regulations 1990 (as amended)

In the opinion of the BBA, RIW Sheetseal Membranes, if used in accordance with the provisions of this Certificate, will satisfy, or contribute to satisfying, the various Regulations and Technical Standards as listed below.

Regulation:	10	Fitness of materials
Standard:	B2.1	Selection and use of materials and components
Comment:		The products comply with this Standard.
Regulation:	17	Preparation of sites and resistance to moisture
Standard:	G2.6	Resistance to moisture from the ground
Standard:	G3.1	Resistance to precipitation penetration
Comment:		The products can enable a floor to satisfy the requirements of this Standard. See section 7.2 of this Certificate.

3 The Building Regulations (Northern Ireland) 1994 (as amended 1995)

In the opinion of the BBA, RIW Sheetseal Membranes, if used in accordance with the provisions of this Certificate, can satisfy the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The products are acceptable materials. See section 11 of this Certificate.
Regulation:	C5	Resistance to ground moisture and weather
Comment:		Data obtained from tests for water resistance on the products, including joints, indicate that the materials satisfy the requirements of this Regulation. See section 7.2 of this Certificate.

Technical Specification

4 Description

4.1 RIW Sheetseal Membranes are two-ply, self-adhesive, damp-proof membranes with a selvedge strip. They comprise a top layer of polyethylene film bonded to a layer of bitumen/polymer adhesive carried on a release paper.

4.2 The membranes are available in the following grades:

RIW Sheetseal 220 — a 0.25 mm thick, low density polyethylene backing film with a bitumen/polymer adhesive bottom layer, for use in waterproofing solid floors, and in internal and external tanking and underground structures.

RIW Sheetseal 223 — a 0.125 mm thick, low density polyethylene backing film with a bitumen/polymer adhesive bottom layer, for use in waterproofing solid floors and in internal and external tanking.

RIW Sheetseal 226 — a 0.1 mm thick, cross-orientated, high density polyethylene backing film with a bitumen/polymer adhesive bottom layer, for use in waterproofing reservoir roofs, solid floors, and in internal and external tanking and underground structures.

4.3 The nominal dimensions of the membranes are shown in Table 1.

Table 1 Nominal dimensions

	RIW Sheetseal 220, RIW Sheetseal 223 and RIW Sheetseal 226
thickness[1] (mm)	1.5
width (m)	1.05
roll length (m)	19.05
roll weight (kg)	34.0
weight per unit (kgm^{-2})	1.7

(1) excluding release paper

4.4 Ancillary items used with the membranes include:

RIW Sheetseal Primer — a solution of bitumen in a petroleum aliphatic hydrocarbon, supplied in 5 litre and 25 litre containers.

RIW Protection Board — a protection layer for use in reservoir roofs and where required in other specifications.

4.5 Quality control on the final product includes checks on:

thickness
width
weight per unit area
tensile strength and elongation at break
low temperature flexibility
adhesion.

5 Delivery and site handling

5.1 Rolls are packed in cardboard containers bearing the manufacturer's name and the BBA identification mark incorporating the number of this Certificate.

5.2 The rolls should be stacked on end and stored under cover.

5.3 RIW Sheetseal Primer is flammable with a flashpoint of 34°C and must be stored away from ignition sources. Extremes of temperature should also be avoided.

Design Data

6 General

6.1 RIW Sheetseal Membranes are satisfactory for use in accordance with the relevant clauses of CP 102 : 1973, Section 2, or BS 8102 : 1990 as damp-proof and/or waterproof membranes, provided they are fully supported and protected.

6.2 RIW Sheetseal 226 is UK WFBS listed for use in waterproofing reservoir roofs when protected using a suitable ballast.

6.3 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.

7 Resistance to water and water vapour

7.1 Tests confirm that the membranes, when completely sealed and consolidated, will adequately resist the passage of moisture from the ground and so meet the requirements of Section 3.3 of Approved Document C4 of the Building Regulations 1991 (as amended 1994) (England and Wales).

7.2 Tests confirm that the membranes, when completely sealed and consolidated, will adequately resist the passage of moisture from the ground and so meet the requirements of Regulation 17, Standards G2.6 and G3.1 for compliance with the Building Standards (Scotland) Regulations 1990 (as amended) and Regulation C5 of the Building Regulations (Northern Ireland) 1994 (as amended 1995).

7.3 The membranes are impervious to water and, when used and installed in accordance with this Certificate, will give a waterproof layer capable of accepting minor structural movements without damage.

8 Resistance to puncture

8.1 The membranes can be punctured by sharp objects and care should be taken in handling building materials and equipment over the exposed surface.

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

9 Adhesion and stability

Tests indicate that the adhesion of RIW Sheetseal to the substrate and to itself, jointed as described in this Certificate, is satisfactory. The properties of RIW Sheetseal accommodate minor movements likely to occur under normal service conditions in the structure in which it is incorporated.

10 Effects of temperature

10.1 At low temperatures the product will become progressively stiffer, which may make it difficult to handle. However, it does not crack at the minimum recommended laying temperature when folded around a 20 mm diameter mandrel.

10.2 At elevated temperature the adhesive will soften, which, under extreme conditions, may cause slippage. With RIW Sheetseal 226 there may also be the risk of curling of the laps caused by the cross-orientation of the polyethylene sheet; however, when used under the conditions of this Certificate (ie the membrane is protected as soon as possible after installation), the sheet will be restrained and will not achieve the temperatures at which these effects occur.

11 Durability

RIW Sheetseal Membranes, 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.

Installation

12 General

12.1 The membranes must be installed in accordance with the relevant requirements of CP 102 : 1973, Section 2, BS 8102 : 1990 and the manufacturer's instructions. Additional guidance on the use of dpm materials is available in BS 8000 : Part 4 : 1989.

12.2 All surfaces to which RIW Sheetseal is 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. Where necessary (ie dusty or porous substrates) the surface should be primed with RIW Sheetseal Primer, at the recommended coverage rate, and allowed to dry. Vertical surfaces must always be primed.

12.3 Vertical surfaces of brickwork and blockwork should be dry and 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.

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

12.5 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.

12.6 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.

13 Procedure

13.1 The release paper 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.

13.2 The polyethylene strip on the selvedges must be removed to expose the bitumen/polymer adhesive to facilitate lapping of the membranes.

13.3 Overlaps should be at least 50 mm onto the backing film along the roll edges and at least 100 mm onto the backing film at the roll ends of the membrane. The membrane surface to be overlapped should be dust free and, to ensure a watertight bond, the upper membrane should be firmly pressed down on to the lower one.

14 Applications

Solid concrete floors

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

External tanking

14.2 The membrane should be applied to the site concrete and then applied to the external face of the structure and into the internal wall. A 300 mm wide strip of membrane should be placed at the angle (containing a 50 mm by 50 mm fillet) where the horizontal surface meets the vertical surface, and at the top where it is tucked into the internal wall. A protection wall of brickwork, blockwork or protection board should be used against the membrane to protect it against puncture during backfilling.

Internal tanking

14.3 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. A 300 mm (minimum) wide strip of membrane should be placed at the angle (containing a 50 mm by 50 mm fillet) where the horizontal surface meets the vertical surface and at the top where the membrane is lapped into the dpc. The product is applied to the walls to achieve the overlaps defined in section 13.3. 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 as the construction proceeds.

Reservoir roof

14.4 RIW Sheetseal 226 is applied to the substrate as defined in sections 13.1 to 13.3. The membrane is protected using RIW Protection Board prior to application of protective ballast (such as paving slabs, pea gravel).

Technical Investigations

The following is a summary of the technical investigations carried out on RIW Sheetseal Membranes.

15 Tests

Samples of the membranes were obtained from the manufacturer for testing. The results of the tests carried out by the BBA, which are typical values for the material, are summarised in Tables 2 to 4.

Table 2 Physical properties — general

Test (units)	Method*	Mean results		
		RIW Sheetseal 220	RIW Sheetseal 223	RIW Sheetseal 226
Weight per unit area (kgm^{-2}) (no release paper)	Direct measurement	1.46	1.63	1.58
Ring and ball softening point (°C)	BS 2000 : Part 58 : 1988	—	—	108
Water vapour permeability (75% RH/25°C) ($gm^{-2}d^{-1}$)	BS 3177 : 1959	0.23	0.28	0.23
Water vapour resistance (75% RH/25°C) ($MNsg^{-1}$)	BS 3177 : 1959	892	733	892

— not tested

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

Table 3 Physical properties — directional

Test (units)	Method*	Mean results					
		RIW Sheetseal 220		RIW Sheetseal 223		RIW Sheetseal 226	
		Long	Cross	Long	Cross	Long	Cross
Tensile strength (N per 50 mm)	BS 2782 : 1976 : 320A						
unaged	(rate=500 mm min^{-1})	313.4	298.4	140.2	136.2	218.5	262.5
heat aged[1]		292.9	314.2	115.0	145.7	220.5	233.9
Elongation at break[2] (%)	BS 2782 : 1976 : 320A						
unaged	(rate=500 mm min^{-1})	770	895	570	995	208	147
heat aged[1]		1000	1300	515	1240	230	150
Dimensional stability unrestrained	MOAT 27 : 5.1.6	+1.6	+2.0	+2.0	+1.6	−0.1	−0.2

(1) Heat aged 56 days at 60°C.
(2) Elongation at break of polyethylene film.

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

Table 4 Service performance

Test (units)	Method*	Mean results		
		RIW Sheetseal 220	RIW Sheetseal 223	RIW Sheetseal 226
Low temperature unrolling	MOAT 27 : 5.4.3	—	—	no cracking
Resistance to water pressure (6 metre head)	MOAT 27 : 5.1.4	no penetration	no penetration	no penetration
Resistance to cracking at 0°C and 20°C	TRRL Report No 636	no cracking	no cracking	no cracking
Low temperature flexibility (20 mm diameter mandrel at 0°C and −5°C)	MOAT 27 : 5.4.2	no cracking	no cracking	no cracking
Impact (free film unprotected on concrete substrate)				
chisel (90° tip, 2J) at 20°C and 0°C		penetration	penetration	penetration
steel ball (64 mm diameter, 98J) at 20°C and 0°C		penetration	penetration	penetration
Peel strength (N per 50 mm)	MOAT 27 : 5.1.3			
control		141.0	—	93.88
heat aged[1]		119.0	—	98.10
Tensile strength of joints (N per 50 mm)				
control	MOAT 27 : 5.2.2	42	—	251
heat aged[1]	MOAT 27 : 5.2.3	112	—	298
water soak[2]	MOAT 27 : 5.2.4	81	—	189
static indentation[3]	MOAT 27 : 5.1.9	—	—	L_4

— not tested

(1) Heat aged 28 days at 60°C.
(2) Water soaked 7 days at 60°C.
(3) Test carried out with membrane protected using 2 mm RIW Protection Board.

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

16 Other investigations

16.1 A re-examination was made of the data and investigations on which the previous Certificate was based, including surveys of known users.

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

Bibliography

BS 2000 *Methods of test for petroleum and its products*
Part 58 : 1988 *Determination of softening point of bitumen. Ring and ball method*

BS 2782 *Methods of testing plastics*
Part 3 *Mechanical properties*
Methods 320A to 320F : 1976(1986) *Tensile strength, elongation and elastic modulus*

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

BS 8000 *Workmanship on building sites*
Part 4 : 1989 *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*

TRRL Report No 636 = Transport and Road Research Laboratory Report No 636.

Conditions of Certification

17 Conditions

17.1 Where reference is made in this Certificate to any Act of Parliament, Regulation made thereunder, Statutory Instrument, Code of Practice, British Standard, manufacturer's instruction or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certificate.

17.2 The quality of materials and the method of manufacture have been examined and found satisfactory by the BBA and must be maintained to this standard during the period of validity of this Certificate. This Certificate will remain valid for an unlimited period provided:

(a) the specification of the product is unchanged; and

(b) the manufacturer continues to have the product checked by the BBA.

17.3 This Certificate will apply only to the product that is installed, used and maintained as set out in this Certificate.

17.4 In granting this Certificate, the BBA makes no representation as to:

(a) the presence or absence of patent or similar rights subsisting in the product; and

(b) the legal right of the Certificate holder to market, install or maintain the product; and

(c) the nature of individual installations of the product, including methods and workmanship.

17.5 It should be noted that any recommendations relating to the safe use of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory or Common Law duties of care, or of any duty of care which exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory or Common Law duties 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 use of this product.

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, RIW Sheetseal Membranes are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 92/2817 is accordingly awarded to RIW Limited.

On behalf of the British Board of Agrément

Date of Second issue: 10th May 1996

Director

**The original Certificate was issued on 14th August 1992. This amended version includes references to the revised Building Regulations and associated text, removal of products without selvedge strip, and inclusion of reservoir roofs as a use for RIW Sheetseal 226.*

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