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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

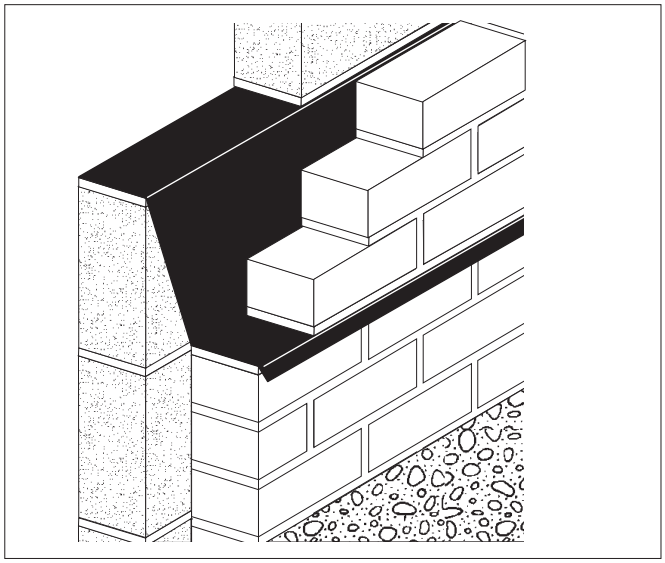
Agrément Certificate
96/3271
Product Sheet 2

XTRA-LOAD DAMP-PROOF COURSE SYSTEMS

XTRA-LOAD PROBUILD DPC SYSTEM

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the Xtra-Load Probuild DPC System, for use to provide horizontal, vertical, or stepped damp-proof courses including cavity trays, in either solid or cavity walls of brick, block, stone or concrete.



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

KEY FACTORS ASSESSED

Behaviour under load — the dpc will not extrude under load, up to the point of compressive failure of the wall (see section 5).

Resistance to water and water vapour — the system will provide an effective barrier against liquid water and water vapour (see section 6).

Compatibility with other materials — within normal construction, the system is compatible with all materials with which it will be in contact, with the exception of timber preservatives based on creosote or tar oils (see section 7).

Durability — when properly specified and installed, the system in normal circumstances, will remain effective during the lifetime of the building (see section 9).

The BBA has awarded this Agrément Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 18 February 2008

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, the Xtra-Load Probuild DPC System, 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:	A1	Loading
Comment:		The dpc will not extrude under load, up to the point of failure of the wall, and will not adversely affect the ability of a properly designed and built wall to sustain and transmit compression loads. The presence of a dpc can reduce the shear and tensile strength of a wall at that point, and design may need to take account of this. See section 5.1 of this Certificate.
Requirement:	C2(a)(b)	Resistance to moisture
Comment:		Properly installed in a correctly designed structure, the system forms an effective barrier to the movement of water within the wall, enabling compliance with this Requirement. See section 6 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable materials. See section 9 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 system can contribute to a construction satisfying this Regulation. See sections 8 and 9 and the *Installation* part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	1.1(a)(b)	Structure
Comment:		The dpc will not extrude up to the point of failure of the wall, and will not adversely affect the ability of the properly designed and built wall to sustain and transmit compression loads, with reference to clauses 1.1.1[(1)(2)] and 1.1.3[(1)(2)]. See section 5.1 of this Certificate.
Standard:	3.4	Moisture from the ground
Standard:	3.10	Precipitation
Comment:		Properly installed in a correctly designed structure, the system forms an effective barrier to the movement of water within the wall, enabling compliance with these Standards, with reference to clauses 3.4.1[(1)(2)] and 3.10.1[(1)(2)]. See section 6 of this Certificate.
Regulation:	12	Building standards — conversions
Comment:		All comments given for the system 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 materials. See section 9 and the *Installation* part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The products do not normally require maintenance. See section 8 of this Certificate.
Regulation:	C4(a)(b)	Resistance to ground moisture and weather
Comment:		Properly installed in a correctly designed structure, the system forms an effective barrier to the movement of water within the wall, enabling compliance with this Regulation. See section 6 of this Certificate.
Regulation:	D1	Stability
Comment:		The dpc will not extrude, up to the point of failure of the wall, and will not adversely affect the ability of a properly designed and built wall to sustain and transmit compression loads. See section 5.1 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* (2.4).

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of the Xtra-Load Probuild DPC System, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.1 *External masonry walls*.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, the Xtra-Load Probuild DPC System, 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*.

General

This Certificate relates to the Xtra-Load Probuild DPC System, comprising a flexible sheet material and preformed cavity tray units manufactured from thermoplastic polymers.

The system is for use to provide horizontal, vertical, or stepped damp-proof courses including cavity trays, in either solid or cavity walls of brick, block, stone or concrete.

The system comprises sheet material for runs of dpc, preformed cloaks for angles, steps and stopends, a compatible adhesive tape and a support system for on-site formation of laps.

It is essential that the system is installed in accordance with the conditions set out in the *Design Considerations* and *Installation* parts of this Certificate.

Technical Specification

1 Description

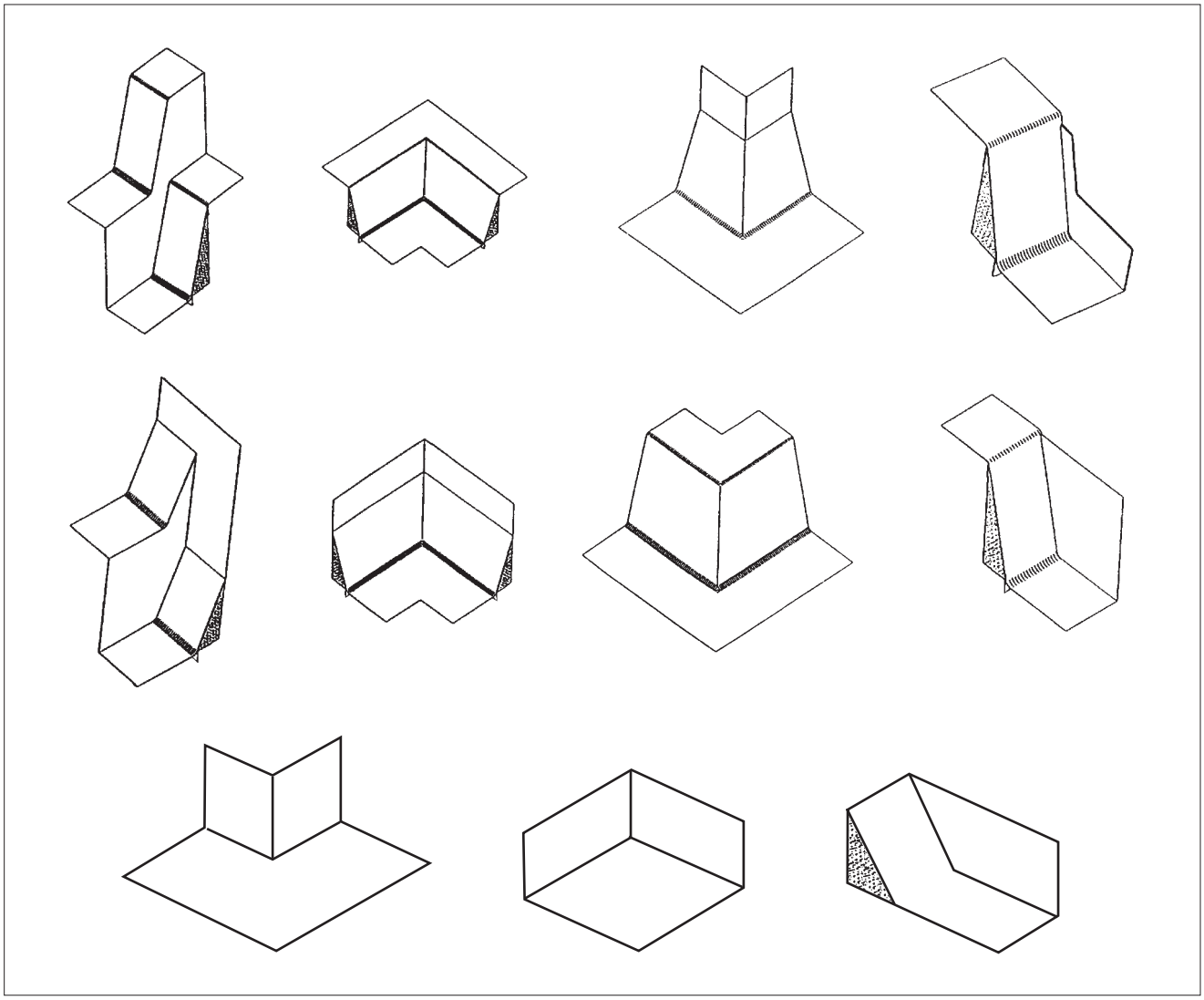
1.1 The Xtra-Load Probuild DPC is a flexible sheet consisting of a blend of thermoplastic polymers and other additives, calendered into sheet form, reeled into rolls and cut to width.

1.2 Xtra-Load Probuild is manufactured to the nominal characteristics of:

Thickness (mm)	1.1
Roll width (mm)	100 to 1000
Roll length (m)	20
Mass per unit area (kgm^{-2})	1.18

1.3 Xtra-Load Preformed Cavity Tray Units are made from 1.2 mm thick, polymer sheet incorporating a joint support and a drip to prevent water transmission across the cavity. The units are available in a range of shapes for angles, changes in level and stopends. Typical examples are shown in Figure 1; units to other designs can be fabricated to order.

Figure 1 Standard Xtra-Load Preformed Cavity Units



1.4 Other materials used with Xtra-Load Probuild include:

- Xtra-Load DPC Joint Support System — a strip of flexible polymer membrane, 100 mm wide and of varying length with an integral joint support and incorporating a drip to prevent water transmission across the cavity. For use in supporting joints in the linear dpc
- Xtra-Load DPC Jointing Tape — a double-sided, self-adhesive tape, protected by a silicone release film. It is used to seal laps between dpc to dpc and between dpc to Preformed Cavity Tray Units, and also used to bond surface fixed cavity tray units to primed masonry and steel surfaces
- Xtra-Seal QD Bitumen Primer — for the preparation of masonry and steel surfaces prior to the application of Xtra-Load DPC Jointing Tape
- Xtra-Load DPC Fixing Strip — 25 mm by 3 mm thick plastic strip 2 m long, pre-drilled with 6 mm holes at 150 mm centres, used to secure surface fixed dpc to substrate.

1.5 Quality control checks are performed during manufacture and on the final products. Quality control checks are carried out Xtra-Load Probuild for:

- thickness
- width
- length
- tensile strength
- elongation at break.

2 Delivery and site handling

2.1 Xtra-Load Probuild DPC is delivered to site in rolls secured with a paper wrapper bearing the marketing company's name and the BBA's identification mark incorporating the number of this Certificate.

2.2 Rolls must be stored on end and under cover, and out of direct sunlight. Xtra-Load Probuild has a good resistance to hydrocarbon solvents such as petroleum spirit and diesel oil, but should not be stored where contact with these materials or other organic solvents is likely.

2.3 Xtra-Load Preformed Cavity Tray Units are delivered to site in cardboard boxes. A label bearing a description of the contents and the BBA identification mark incorporating the number of this Certificate is affixed to each box.

2.4 Xtra-Load DPC Jointing Tape is supplied in 25 m by 50 mm rolls in cardboard cartons bearing a label with a description of the contents and the BBA identification mark incorporating the number of this Certificate.

2.5 Xtra-Load DPC Joint Support System is supplied in cardboard boxes complete with roll of jointing tape. A label bearing the BBA identification mark incorporating the number of this Certificate is affixed to each box.

2.6 Xtra-Load DPC Fixing Strip is supplied in packs of 20 lengths of strip, 25 mm wide by 3 mm thick and 2 m long. The packs are protected by a plastic sleeve and a label bearing the BBA identification mark incorporating the number of this Certificate is affixed to each pack.

2.7 Xtra-Seal QD Bitumen Primer is delivered to site in 5 litre and 25 litre drums. The system is classified under *The Chemicals (Hazard Information and Packaging for Supply Regulations 2002* (CHIP3) as 'flammable', with a flashpoint below 32°C, and must be stored in accordance with the *Highly Flammable Liquids and Petroleum Gases Regulations 1997*.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Xtra-Load Probuild DPC System.

Design Considerations

3 Use

When correctly specified and installed the Xtra-Load Probuild DPC provides satisfactory horizontal, vertical, or stepped damp-proof coursing (including cavity trays) in either solid or cavity walls of masonry. General standards of good design practice should be followed, in accordance with BS 5628-3 : 2005.

4 Practicability of installation

Installation can be carried out readily by bricklayers experienced with this type of installation.

5 Behaviour under load

5.1 The dpc will not extrude under load, up to the point of compressive failure of the wall, and will not adversely affect the ability of a properly designed and built wall to sustain and transmit compression. The stability of a wall in respect of lateral loads must be checked in relation to the stresses permitted between the dpc and the mortar. The characteristic stresses for design purposes are detailed in the product literature and further guidelines are available from the marketing company.

5.2 The system will withstand considerable movement of the wall, and is unlikely to be impaired by normally occurring movements up to the point where the wall itself is deemed to have failed.

6 Resistance to water and water vapour

The product, when correctly specified and installed, will provide an effective barrier against liquid water and water vapour either from a source external to the structure or from one part of a structure to another.

7 Compatibility with other materials

The system is compatible with most materials with which it is likely to come into contact in normal constructions, including timber preservatives of water-based solutions of salts. It is not, however, compatible with timber preservatives based on creosote or tar oil and therefore must not come into contact with these materials. Where there is doubt as to the compatibility with materials in contact, the advice of the Certificate holder should be sought.

8 Maintenance

As the system is confined within the wall and wall cavity and has suitable durability (see section 9), maintenance is not required. However, it must be ensured that damage occurring before enclosure is repaired (see section 13).

9 Durability

Artificial ageing tests indicate that a satisfactory retention of physical properties is achieved. When properly specified and installed, the membranes will in normal circumstances remain effective during the lifetime of the building.

Installation

10 General

10.1 Installation of the Xtra-Load Probuild DPC System must follow normal good practice for the detailing of damp-proof courses, as set out in BS 5628-3 : 2005, and must be in accordance with the relevant clauses of BS 8000-3 : 2001, BS 8215 : 1991, BRE Digest 380 *Damp-proof courses*, and the Certificate holder's instructions.

10.2 As with all flexible dpc's care should be taken to avoid impact damage from sharp objects (eg trowel) during installation.

10.3 Xtra-Load Probuild DPC is handled and cut as conventional flexible damp-proof courses. It retains sufficient flexibility to be used at the lowest temperature at which walls are normally built and does not become tacky in warm, ambient weather conditions.

10.4 It is difficult to form certain details with the dpc, particularly when bending the material through two angles at the same time. In such cases, care must be taken to achieve a satisfactory seal, and where necessary Preformed Cavity Tray Units should be used. Joints in the dpc should be formed on site by means of Xtra-Load DPC Joint Support System. Joints between the dpc and preformed units do not require the use of the support system (see section 12.5). Care should be taken at temperatures below 5°C to avoid the risk of condensation on jointed surfaces, which may affect the efficiency of the self-adhesive tape.

11 Procedure

11.1 The following installation practices are essential:

- the dpc must extend through the full thickness of the wall or wall-leaf, including pointing, applied rendering or other facing material, and project 5 mm beyond the finished external face
- the dpc must be laid on an even bed of mortar, and perforations in adjacent courses of brickwork must be closed with mortar
- the dpc must always be sandwiched between wet mortar and not laid dry
- all lap joints in the dpc must have 100 mm overlap and be sealed, according to section 12
- preformed units must be used at stopends, and at all corners or changes in levels of Preformed Cavity Tray Units.

11.2 When using the dpc with boot lintels or similar constructions, it is recommended that the material is installed to follow the lintel profile, where appropriate.

11.3 As with most other damp-proof course materials, damage can occur during cleaning of mortar droppings from the damp-proof course unless care is taken. The following recommendations should prevent damage occurring:

- cavity battens should be used to prevent excessive amounts of mortar droppings reaching the damp-proof course
- mortar droppings should be removed before they have had time to harden
- implements such as steel rods should never be used for cleaning
- damp-proof courses should be examined for damage and repaired as required as work proceeds.

12 Jointing procedures

12.1 All surfaces to be jointed should be clean and dry. Release paper protecting the self-adhesive strips should not be removed until the joint is ready to be formed. The tape should not be left exposed overnight or during periods of low temperatures.

12.2 The support unit should be fitted in such a way as to span the cavity, the ends of the support being bent so as to bear upon the inner and outer leaves of the wall for a distance of 25 mm to 40 mm. The vertical surface of the polystyrene wedge must be positioned against the cavity face of the inner leaf or cavity face of the insulation panel.

12.3 The first layer of dpc to be joined should be offered up to the support unit. The release paper should be removed from the adhesive face of the joint support and, by application of uniform pressure, the dpc bonded to it.

12.4 The layer of dpc to be lapped to the first should be placed in the usual way allowing a 100 mm lap joint and bonded using Xtra-Load Jointing Tape, ensuring that a full seal is achieved.

12.5 When making joints between dpc and Preformed Cavity Tray Units the joint support forms an integral part of the Preformed Cavity Tray Unit and therefore joints should be made by lapping the dpc onto the Preformed Cavity Tray Unit by 100 mm and sealing the joint with Xtra-Load DPC Jointing Tape.

12.6 Where the dpc or Preformed Cavity Tray Unit is required to be bonded to a brick, block or concrete substrate it can be held in place, temporarily, by the self-adhesive tape bonded to the substrate, which must be primed with Xtra-Seal QD Bitumen Primer. A permanent mechanical fixing should then be installed using Xtra-Load DPC Fixing Strip.

12.7 Further advice on the use of these materials may be obtained from the Certificate holder.

13 Repair

Damaged dpc and cavity tray units should be replaced prior to the installation of brick, block or masonry courses above the dpc/cavity tray unit.

Technical Investigations

14 Tests

14.1 Samples of Xtra-Load Probuild DPC and the preformed cavity tray units were obtained from the Certificate holder for testing. The results of the tests carried out by the BBA are summarised in Tables 1 and 2.

Table 1 Physical properties — general (Xtra-Load Probuild)

Test (units)	Mean results	Method[1]
Tensile strength (Nmm^{-2})		BS EN 12311-2
longitudinal	13.3	
transverse	9.7	
Elongation at maximum load (%)		BS EN 12311-2
longitudinal	594	
transverse	587	
Nail tear (N)		BS EN 12310-1
longitudinal	215	
transverse	188	
Dimensional stability (%)		BS EN 1107-2
longitudinal	–1.0	
transverse	–0.5	
Chisel impact		BBA T1/13[2]
0°C	complete penetration	
20°C	part penetration	

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

(2) Test method based on Appendix B : Department of Transport Checks and Tests for the Approval of Waterproofing Systems for Concrete Decks to Highway Bridges : C(v).

Table 2 Physical properties — directional (preformed cavity trays)

Test (units)	Mean results		Method[1]
	Longitudinal	Transverse	
Tensile strength (Nmm^{-2})			BS 2782-3.320A
control	16.0	13.7	
heat aged[2]	16.5	15.3	
water soak[3]	15.2	13.7	
Elongation at break (%)			BS 2782-3.320A
control	640	675	
heat aged[2]	697	704	
water soak[3]	612	679	
Tear strength (Nmm^{-1})	128.0[5]	117.4[5]	*ad-hoc*[4]

(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 56 days at 60°C.
(3) Water soak 28 days at 23°C.
(4) BBA method based on BS 2782-3.360B : 1980.
(5) Maximum load achieved.

14.2 The following tests were carried out on a similar specification and composition material to the Xtra-Load Probuild DPC System from the same factory:

- water vapour transmission
- heat ageing
- bitumen compatibility
- low temperature flexibility
- water soak
- resistance to leakage of joints
- cold flex temperature
- short term UV ageing
- tensile strength of joints.

15 Investigations

15.1 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.

15.2 An examination was made of reports of shear testing carried out to BS DD 86-1 : 1983. The results were found to be satisfactory.

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 5628-3 : 2005 *Code of practice for the use of masonry — Materials and components, design and workmanship*

BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*

BS 8215 : 1991 *Code of practice for design and installation of damp-proof courses in masonry construction*

BS DD 86-1 : 1983 *Damp-proof courses — Methods of test for flexural bond strength and short term shear strength*

BS EN 12310-1 : 2000 *Flexible sheets for waterproofing — Determination of resistance to tearing (nail shank)— Part 1 — Bitumen sheets for roof waterproofing*

BS EN 12311-1 : 2000 *Flexible sheets for waterproofing — Determination of tensile properties — Part 1 — Bitumen sheets for roof waterproofing*

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 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

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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