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Agrément Certificate

**96/3271**

Product Sheet 4

## XTRA-LOAD DAMP-PROOF COURSE SYSTEMS

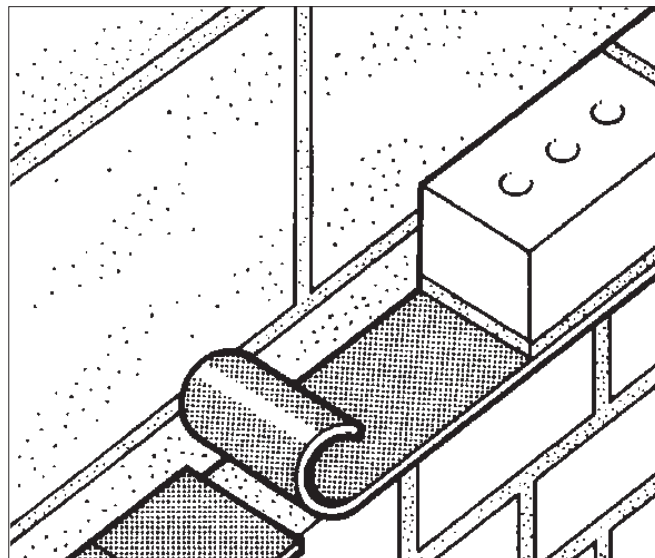
### XTRA-LOAD ALUMITE GAS RESISTANT DPC

#### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Xtra-Load Alumite Gas Resistant DPC, a polymer-modified bitumen membrane incorporating an aluminium foil inter-ply and reinforced with a non-woven polyester fabric for use as a gas-resistant, damp-proof course in masonry walls.

#### 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 product is suitable for use under low compressive stress conditions as defined in BS 6398 : 1983 and will not significantly extrude under these conditions (see section 5).

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

**Resistance to radon and landfill gases** — the product will provide an effective barrier against radon and landfill gases (see section 7).

**Compatibility with other materials** — within normal construction, the product is compatible with all materials which it will be in contact, with the exception of timber preservatives based on creosote or tar oils (see section 8).

**Durability** — when properly specified and installed, the product in normal circumstances, will remain effective during the lifetime of the building (see section 10).

The BBA has awarded this Agrément Certificate to the company named above for the product described herein. This product 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 2009

Simon Wroe  
Head of Approvals — Materials

Greg Cooper  
Chief Executive

*The BBA is a UKAS accredited certification body — Number 1113. 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](http://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, Xtra-Load Alumite Gas Resistant DPC, 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 product is suitable for use under low compressive stress conditions and will not adversely affect the ability of a properly designed wall to sustain and transmit the resulting loads to the ground. See sections 5.1 and 5.2 of this Certificate.
Requirement:	C1(2)	Site preparation and resistance to contaminants
Comment:		The product can contribute to satisfying this Requirement. See section 7.1 of this Certificate.
Requirement:	C2(a)	Resistance to moisture
Comment:		Properly installed in a correctly designed structure, the product will form 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 product is acceptable. See section 10 and the <i>Installation</i> 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 product satisfies the requirements of this Regulation. See sections 9 and 10 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	1.1(a)(b)	Structure
Comment:		The product is suitable for use under low compressive stress conditions and will not adversely affect the ability of a properly designed wall to sustain and transmit the resulting loads to the ground, with reference to clauses 1.1.1 <sup>(1)(2)</sup> and 1.1.3 <sup>(1)(2)</sup> . See sections 5.1 and 5.2 of this Certificate.
Standard:	3.1	Site preparation — harmful and dangerous substances
Standard:	3.2	Site preparation — protection from radon gas
Comment:		The product can contribute to satisfying the requirements of these Standards, with reference to clauses 3.1.6 <sup>(1)(2)</sup> , 3.2.0 <sup>(1)(2)</sup> , 3.2.1 <sup>(2)</sup> and 3.2.2 <sup>(1)</sup> . See section 7.1 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		Properly installed in a correctly designed structure, the product will form an effective barrier to the movement of water within the wall, enabling compliance with this Standard, with reference to clause 3.4.1 <sup>(1)(2)</sup> . See section 6 of this Certificate.
Regulation:	12	Building standards — conversions
Comment:		All comments given for the product under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> . (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 product is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The product does not normally require maintenance. See section 9 of this Certificate.
Regulation:	C2(b)	Preparation of site and resistance to dangerous and harmful substances
Comment:		The product can contribute to satisfying this Regulation. See section 7.1 of this Certificate.
Regulation:	C4(a)	Resistance to ground moisture and weather
Comment:		Properly installed in a correctly designed structure, the product will form 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 product is suitable for use under low compressive stress conditions and will not adversely affect the ability of a properly designed wall to sustain and transmit the resulting loads to the ground. See sections 5.1 and 5.2 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* (2.1 and 2.3).

# Non-regulatory Information

## NHBC Standards 2008

NHBC accepts the use of Xtra-Load Alumite Gas Resistant DPC, 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, Xtra-Load Alumite Gas Resistant DPC, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 3, Sub-section *dpc and dpm* (page 107).

## General

This Certificate relates to Xtra-Load Alumite Gas Resistant DPC, a polymer-modified bitumen membrane incorporating an aluminium foil inter-ply and polyester fabric reinforcement for use as a gas-resistant and damp-proof course at ground level in masonry walls.

The product must be used in conjunction with gas-resistant membranes when resistance to landfill gases and/or radon gas from the ground into a building is required. The Certificate holder must be consulted for suitable products.

The product must be installed in accordance with the Certificate holder's instructions, relevant British Standards, Codes of Practice and this Certificate.

## Technical Specification

### 1 Description

1.1 Xtra-Load Alumite Gas Resistant DPC is a sand surfaced, polymer-modified bitumen membrane incorporating an aluminium foil inter-ply and reinforced with a non-woven polyester fabric.

1.2 The sheet is manufactured to the following dimensions:

length (m)	8
width (mm)	100 to 1000
nominal thickness (mm)	3
weight per unit area (kgm <sup>-2</sup> )	3.87 ± 0.25

1.3 Other products include:

- Xtra-Load Preformed Cavity Tray Units — 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
- Monobond LT Sealant Tape — a butyl-based sealant tape for sealing between the Xtra-Load Alumite Gas Resistant DPC and gas-resistant membranes
- 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 used to support joints in the dpc
- Xtra-Load DPC Fixing Strip — 2 m long by 25 mm wide by 3 mm thick plastic strip, pre-drilled with 6 mm diameter holes at 150 mm centres, used to secure surface fixed cavity tray dpc's to substrate
- Xtra-Seal QD Bitumen Primer — for preparation of masonry prior to bonding of dpc's to the substrate.

1.4 Quality control checks are performed during manufacture and on the final product.

### 2 Delivery and site handling

2.1 Xtra-Load Alumite Gas Resistant DPC is delivered to site in rolls secured with a paper wrapper bearing the marketing company's name, product details and the BBA identification mark incorporating this Certificate number. Rolls must be stored on end and under cover protected from extremes of temperature. The product must not be allowed to come into contact with organic solvents.

2.2 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 the appropriate Certificate is affixed to each box.

2.3 Xtra-Seal QD Bitumen Primer is delivered to site in 5 litre or 25 litre drums. The product is classified under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002* (CHIP3) as 'flammable', with a flashpoint of approximately 32°C, and must be stored in accordance with the *Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972*. The product label and manufacturer's material safety data sheet should be consulted to ensure the safe use of the product.

# Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Xtra-Load Alumite Gas Resistant DPC.

## Design Considerations

### 3 Use

3.1 Xtra-Load Alumite Gas Resistant DPC, when correctly specified and installed in accordance with this Certificate will provide a satisfactory gas-resistant damp-proof course at ground level in masonry walls. General standards of good design practice are given in BS 5628-3 : 2005 and BS 8215 : 1991. Recommended uses for bitumen damp-proof courses are given in BS 6398 : 1983.

3.2 The product will restrict the passage of radon, methane and carbon dioxide into the wall cavity from landfill and naturally occurring sources.

3.3 The product must be used in conjunction with a gas-resistant membrane to restrict the ingress of gas into buildings. The Certificate holder must be consulted for suitable products and recommended detailing practices.

### 4 Practicability of installation

The product is only installed by specialised trades. Care must be taken to ensure joints are well made by torching and joints in cavity trays are supported using the Xtra-Load DPC Joint Support System.

### 5 Behaviour under load



5.1 The product will not adversely affect the ability a properly designed wall to sustain and transmit compression loads. Creep tests carried out on the product indicate that it will not significantly extrude at loads of up to  $1 \text{ Nmm}^{-2}$  and is suitable for use under low compressive stress conditions as defined in BS 6398 : 1983.

5.2 The presence of a dpc can reduce the shear and tensile (and therefore, bending) strengths of a wall at that point and the design of the structure should take account of this. Shear tests carried out on the product to BS EN 1052-4 : 2000 gave a characteristic initial shear strength for the product of  $0.31 \text{ Nmm}^{-2}$ .

### 6 Resistance to water and water vapour



When correctly installed, the product will provide an effective barrier against liquid water and water vapour either from a source external to the structure, or from one part of the structure to another, (see the *Technical Investigations* section, Table for *Physical properties — general*).

### 7 Resistance to radon and landfill gases



7.1 The results of gas permeability tests indicate that the product when properly sealed and consolidated will restrict the ingress of radon, methane and carbon dioxide gases from naturally occurring and landfill sources into the wall cavity (see the *Technical Investigations* section, Table for *Physical properties — general*).

7.2 Buildings in areas of risk from radon or landfill gases should be constructed in accordance with the recommendation of BRE Report 211 *Radon : guidance on protective measures for new dwellings*; BRE Report 212 *Construction of new buildings on gas-contaminated land* and BRE Digest 414 *Protective measures for housing on gas-contaminated land*.

### 8 Compatibility with other materials

8.1 Under normal circumstances the product is compatible with other materials it is likely to be in contact with in normal construction, with the exception of timber preservatives containing creosote, tar oils or pitch.

8.2 The product contains an aluminium foil inter-ply which may be subject to corrosion under alkaline conditions if damage to the membrane occurs and the foil is exposed.

### 9 Maintenance



As the product is confined within the wall structure and it has suitable durability (see section 10), maintenance is not required. However, it must be ensured that damage occurring before enclosure is repaired (see section 14).

### 10 Durability



Laboratory tests, including accelerated ageing tests, indicate that the product has acceptable resistance to damage and a satisfactory retention of physical properties is achieved. When properly specified and installed, the product will in normal circumstances remain effective during the lifetime of the building.

## 11 General

11.1 Installation of Xtra-Load Alumite Gas Resistant DPC must follow normal good practice for the detailing of damp-proof courses, as set out in BS 5628-3 : 2001, 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.

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

## 12 Procedure

12.1 The product must extend through the full thickness of the wall or wall leaf, including pointing, applied rendering or other facing material.

12.2 The product must be laid on a wet, even bed of mortar, and perforations in adjacent courses of brickwork must be filled completely with mortar.

12.3 All joints in the product must have a minimum 100 mm overlap and be sealed by torching in accordance with the Certificate holder's instructions. Joints must be supported across cavities using the Xtra-Load DPC Joint Support System.

12.4 Care must be taken to avoid damaging the product during the installation or during cavity cleaning following installation.

12.5 Precautions to be taken during subsequent work include:

- use of cavity battens to prevent mortar droppings from reaching the product
- removal of mortar droppings before they harden
- implements such as steel rods must not be used for cleaning the cavity
- inspection for damage as the work proceeds.

## 13 Dpc/dpm connections and continuity

13.1 To ensure the integrity as a gas barrier system, the product must be connected to a suitable gas-resistant, damp-proof membrane, eg Monarflex RMB 400. Typical details for external wall to solid and suspended ground slabs are shown in Figure 1.

13.2 The product is hot bonded by torching to the primed floor slab and down the cavity face of the internal leaf or slab edge a minimum of 75 mm and project onto the slab by a minimum of 150 mm beyond the internal face of the inner leaf.

13.3 The gas-resistant, damp-proof membrane is overlapped by a minimum of 150 mm over the product and the laps sealed with 30 mm wide Monobond LT Sealant Tape.

13.4 The product is applied to the primed inner leaf/slab edge and fully bonded by torching, ensuring that it terminates a minimum of 150 mm above the dpc or cavity tray in the outer leaf and completely overlaps the product applied around and down the edge of the slab (see section 13.2).

13.5 The product must be used to form a cavity tray linking with the waterproofing and finishing in the outer leaf a minimum of 150 mm above finished external ground level.

## 14 Repair

Damaged areas of the product can be easily repaired prior to being covered, by cutting out and replacing the damaged section, ensuring joints are made in accordance with section 12.3. Once covered the product cannot be repaired.

# Technical Investigations

## 15 Tests

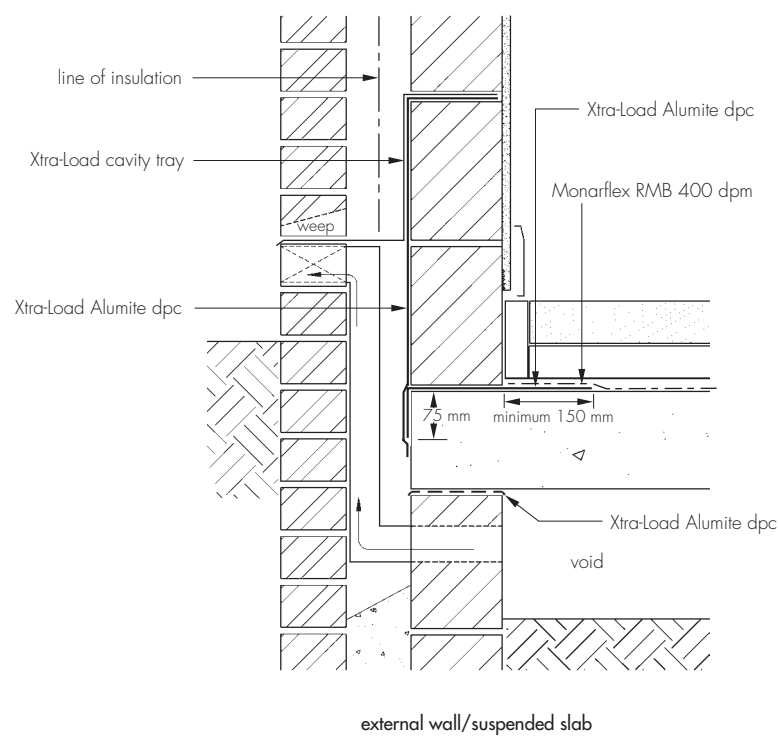
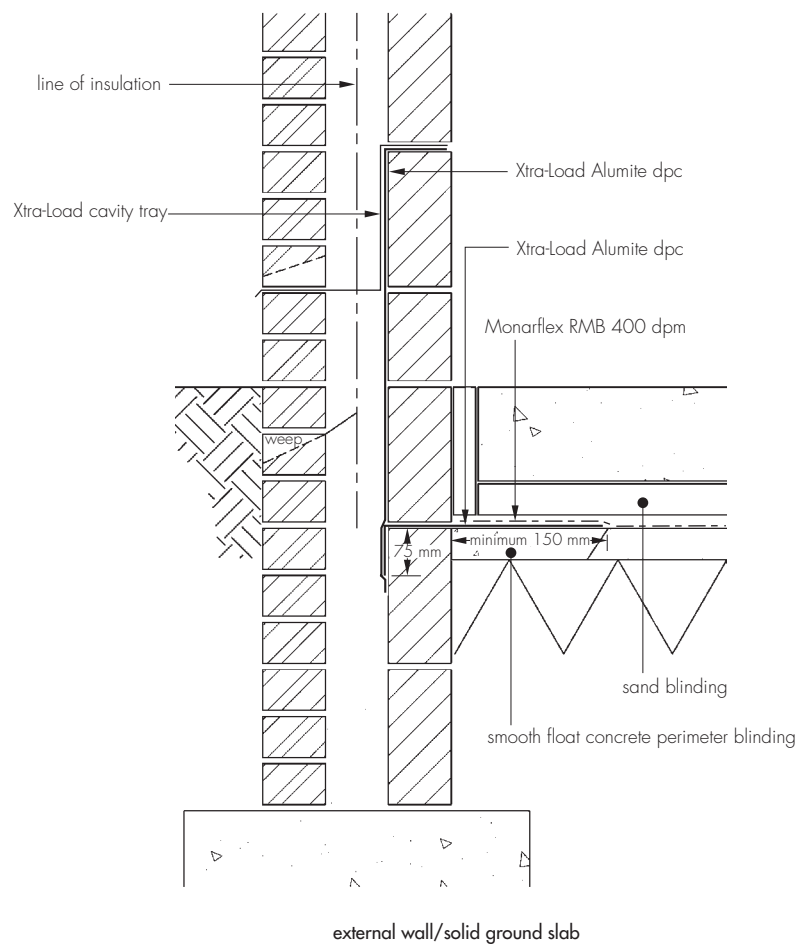
Samples of the product were obtained from the Certificate holder for testing. The results of the tests are summarised in Tables 1 and 2.

## 16 Investigations

16.1 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.

16.2 A survey of users and/or specifiers of the product was carried out. The responses received were satisfactory.

Figure 1 dpc/dpm gas membrane connections and continuity



**Table 1** Physical properties – general

Test (units)	Mean result	Method <sup>(1)</sup>
Weight per unit area (kgm <sup>-2</sup> )	4.022	BS EN 1849-1
Resistance to water pressure	No leaks	MOAT 27 (5.1.4)
Water vapour permeability (gm <sup>-2</sup> 24 h <sup>-1</sup> ) <sup>(2)</sup>	0.06	BS 3177
Water vapour resistance (MNsg <sup>-1</sup> ) <sup>(2)</sup>	3420	BS 3177
Resistance to static indentation (kg) <sup>(3)</sup>	5	BS EN 12730
Resistance to chisel impact		BBA Method T1/13
0°C	No penetration	
20°C	No penetration	
Creep test		BS DD 86-2
deformation (μ strain)	6277	
maximum extrusion (mm)	2.0	
Characteristic initial shear strength (Nmm <sup>-2</sup> )	0.3096	BS EN 1052-4
Radon diffusion coefficient (m <sup>2</sup> s <sup>-1</sup> )		K124/02/95 <sup>(4)</sup>
Xtra-Load Alumite	1.5 × 10 <sup>-14</sup>	
Xtra-Load Alumite with joint	9.9 × 10 <sup>-15</sup>	
Carbon dioxide diffusion resistance (cm <sup>2</sup> s <sup>-2</sup> )		BS EN 1062-6 <sup>(5)</sup>
Xtra-Load Alumite	3.71 × 10 <sup>-7</sup>	
Xtra-Load Alumite with joint	1.03 × 10 <sup>-6</sup>	
Methane gas permeability (m <sup>2</sup> s <sup>-1</sup> )		Rilem Report 12 <sup>(6)</sup>
Xtra-Load Alumite	3.71 × 10 <sup>-7</sup>	
Xtra-Load Alumite with joint	1.03 × 10 <sup>-6</sup>	

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

(2) Temperate conditions (25°C/0/75% RH).

(3) Maximum load at which no penetration occurred.

(4) Czech Technical University (CIA accredited method).

(5) Taylor Woodrow Technology UKAS accredited in-house test procedure TP950/05/13569 — Issue 1 (Generally in accordance with BS EN 1062-6 : 2002).

(6) Taylor Woodrow Technology in-house test procedure in general accordance with *Rilem Report 12, Performance Criteria for Concrete Durability*, E & F Spon, London, UK pp 226-231.

**Table 2** Physical properties – directional

Test (units)	Mean result		Method <sup>(1)</sup>
	Longitudinal	Transverse	
Tensile strength (N 50 mm <sup>-1</sup> )			BS EN 12311-1
control	675	390	
heat aged <sup>(2)</sup>	770	400	
water soak <sup>(3)</sup>	815	385	
Elongation (%)			BS EN 12311-1
control	34	26	
heat aged <sup>(2)</sup>	35	16	
water soak <sup>(3)</sup>	39	36	
Flexibility at low temperature (°C) <sup>(4)</sup>			MOAT 27 (5.4.2)
control	0	0	
heat aged <sup>(2)</sup>	5	5	
Nail Tear (N)	156	199	BS EN 12310-1

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

(2) 56 days at 60°C.

(3) 7 days at 60°C.

(4) Lowest temperature at which no failure occurred.

## Bibliography

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

BS 5628-3 : 2001 *Code of practice for use of masonry — Materials and components, design and workmanship*

BS 6398 : 1983 *Specification for bitumen damp-proof courses for masonry*

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 86-2 : 1984 *Damp-proof courses — Methods of test for creep deformation*

BS EN 1052-4 : 2000 *Methods of test for masonry—Determination of shear strength including damp proof courses*



BS EN 1062-6 : 2002 *Paints and varnishes — Coating materials and coating systems for exterior masonry and concrete — Determination of carbon dioxide permeability*

BS EN 1849-1 : 2000 *Flexible sheets for waterproofing — Determination of thickness and mass per unit area — Bitumen sheets for roof waterproofing*

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*

BS EN 12730 : 2001 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to static loading*

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

## Conditions of Certification

### 17 Conditions

17.1 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.

17.2 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.

17.3 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.

17.4 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.

17.5 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.