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Agrément Certificate
11/4853
Product Sheet 1

FLEX-R WATERPROOFING SYSTEMS

CLASSICBOND NON-REINFORCED EPDM

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to ClassicBond Non-reinforced EPDM, for use on flat and pitched roofs. Applications include loose-laid and ballasted, fully adhered and inverted roofs.

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

Weathertightness — the systems will resist the passage of moisture to the interior of the building (see section 5).

Properties in relation to fire — the systems will enable a roof to be unrestricted under the Building Regulations (see section 6).

Resistance to wind uplift — the systems will resist the effects of any likely wind suction acting on the roof (see section 7).

Resistance to foot traffic — the systems will accept the limited foot traffic and loads associated with the installation and maintenance (see section 8).

Durability — under normal service conditions, the systems will provide a durable waterproof covering with a service life of at least 20 years (see section 10).

The BBA has awarded this Agrément Certificate to the company named above for the systems described herein. These systems 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

Simon Wroe
Head of Approvals — Materials

Greg Cooper
Chief Executive

Date of First issue: 10 August 2011

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, ClassicBond Non-reinforced EPDM, 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 2010 (England and Wales)

Requirement: B4(2)	External fire spread
Comment:	On suitable substructures the use of the systems will enable a roof to be unrestricted under this Requirement. See sections 6.1 to 6.3 of this Certificate.
Requirement: C2(b)	Resistance to moisture
Comment:	The systems, including joints, will enable a roof to meet this Requirement. See section 5.1 of this Certificate.
Requirement: Regulation 7	Materials and workmanship
Comment:	The systems are 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 systems satisfies the requirements of this Regulation. See sections 9.1, 9.2, 10 and the <i>Installation</i> part of this Certificate.
Regulation: 9	Building standards – construction
Standard: 2.8	Spread from neighbouring buildings
Comment:	The systems when applied to a suitable substrate are regarded as having low vulnerability under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 6.1 to 6.3 of this Certificate.
Standard: 3.10	Precipitation
Comment:	The systems, including joints will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 5.1 of this Certificate.
Standard: 7.1(a)	Statement of sustainability
Comment:	The systems can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation: 12	Building standards – conversions
Comment:	Comments made in relation to the systems under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation: B2	Fitness of materials and workmanship
Comment:	The systems are acceptable. See section 10 and the <i>Installation</i> part of this Certificate.
Regulation: B3(2)	Suitability of certain materials
Comment:	The membranes are acceptable. See sections 9.1 and 9.2 of this Certificate.
Regulation: C4(b)	Resistance to ground moisture and weather
Comment:	The systems, including joints, will enable a roof to satisfy the requirements of this Regulation. See section 5.1 of this Certificate.
Regulation: E5(b)	External fire spread
Comment:	On suitable substructures, the use of the systems will enable a roof to be unrestricted under the requirements of this Regulation. See sections 6.1 to 6.3 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* (1.3) and 2 *Delivery and site handling* (2.3 and 2.4) of this Certificate.

Non-regulatory Information

NHBC Standards 2011

NHBC accepts the use of ClassicBond Non-reinforced EPDM, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 7.1 *Flat roofs and balconies*.

1 Description

1.1 ClassicBond Non-reinforced EPDM roof waterproofing sheet is manufactured by blending EPDM (ethylene-propylene diene monomer), processing oils and other additives. The sheets are produced by calendaring or extruding, then vulcanising. The membrane is available in a standard dusted form or a clean membrane to aid joint splicing.

1.2 A version of the membranes with a factory applied tape (FAT) as an alternative method of splicing are available.

1.3 The nominal characteristics of the membranes are:

Thickness (mm)	1.14 1.52
Width (m)	1.37, 3.05, 6.10, 9.15, 12.20, and 15.25
Length (m)	15.25, 30.50, 38.10, 45.72, or 61.00 ⁽¹⁾
Mass per unit area (kg·m ⁻²)	1.14 mm thick: 1.2, 1.52 mm thick: 1.8
Colour	grey/black

(1) Only available in 1.14 mm thick membrane.

1.4 ClassicBond White is a white version of ClassicBond Non-reinforced EPDM in which the top laminate is coloured white. It is manufactured to the same specifications and has the same nominal properties as the black version.

1.5 Ancillary items for use with these systems are:

- EPDM Elastoform and ClassicBond White Flashing — non-vulcanised (uncured) EPDM 1.5 mm thick with a polythene backing, available in widths from 150 mm to 450 mm
- Bonding adhesive 90.8.30A — a solvent-based contact cement, based on polychloroprene (Neoprene) for bonding the EPDM sheet to the substrate
- Pressure-sensitive products — a range of detailing products (such as flashings, corners) with a pressure adhesive incorporated
- Splicing Cement EP95 — a cement based on solvent, butyl rubber and other synthetic resins which is cold-applied to bond laps between EPDM sheets and/or EPDM flashing
- SecurTape — a synthetic rubber-based tape for use in lap jointing
- Factory Applied Tape (FAT) — 75 mm or 150 mm wide, factory applied SecurTape for on-site jointing
- In-seam Sealant — a rubber-based sealant applied within lap joints made using Splicing Cement EP95 only
- HP-250 Primer — a primer for use with Splicing Cement, SecurTape or pressure-sensitive products in preparation of membrane surface
- LV-600 Primer — an alternative primer for use with Splicing Cement, SecurTape or pressure-sensitive products in preparation of membrane surface
- Splice Cleaner — a synthetic rubber/resin solution for cleaning EPDM prior to bonding laps, except when splice tape is used
- Lap Sealant — an EPDM mastic to form a feathered edge along lap edges at flashings and details and at field splices when Splicing Cement EP95 is used
- Water Cut-off Mastic — a synthetic rubber/resin sealing mastic to act as a sealing agent between the EPDM or flashing sheets and accessories
- Walkway sheeting — a special 8 mm thick styrene butadiene rubber (SBR) sheet, to give additional protection in areas of high accessibility
- Colour coating — an acrylic, elastic roof coating to provide optional roof colours
- ClassicBond White accessories — ClassicBond White splicing cement, ClassicBond White Splice Cleaner and ClassicBond White Lap Sealant are used with ClassicBond White and serve the same purpose as their counterparts
- Pourable sealer — a two-component, solvent-free, polyurethane-based sealant, for use in areas where flashing is difficult to apply
- RUSS strip — a reinforced EPDM membrane strip which is fastened to the substrate. The membrane is adhered to this at the roof perimeter and penetrations
- Fasteners and fastening plates — for use in mechanically fastened applications
- Termination bars — for fixing membrane at roof perimeters.

1.6 Quality control checks are carried out during production and on the finished product.

2 Delivery and site handling

2.1 The membranes are delivered to site in rolls wrapped in polyethylene. Provision may be required for load spreading and handling at roof level when large area sheets are used. The wrapper bears the product name, identification and the BBA identification mark incorporating the number of this Certificate.

2.2 Rolls should be stored on the delivery pallet, horizontally in a cool, dry area and kept under cover. The membranes should only be unwrapped from packaging at time of installation and unused material returned to its packaging until required.

2.3 The accessories are normally delivered in quantities of:

Splicing Cement EP95 and HP-250 Primer	3.8 litre or 9.5 litre cans
Splice Cleaner, bonding adhesive and colour coating	3.8 litre or 18.9 litre cans
Lap Sealant	25-tube cartons
Water Cut-off Mastic and In-seam Sealant	10-tube cartons
LV-600 Primer	3.8 litre cans

2.4 Ancillary items classified under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP4)/Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulations) 2009* are given in Table 1 along with flashpoints. These products bear the appropriate hazard warning.

Table 1 Flashpoint and hazard classification

Materials	Flashpoint (°C)	Classification
Bonding Adhesive 90.8.30A ⁽¹⁾	-20.0	Extremely Flammable, Harmful
Splicing Cement EP95 ⁽¹⁾	4.0	Highly Flammable, Harmful
Lap Sealant ⁽¹⁾	4.4	Highly Flammable, Harmful
In-seam Sealant ⁽¹⁾	4.4	Highly Flammable, Harmful
Water Cut-off Mastic ⁽¹⁾	11.0	Highly Flammable
HP-250 Primer ⁽¹⁾	4.4	Highly Flammable, Harmful
LV-600 Primer	93.0	Harmful
Splice Cleaner ⁽¹⁾	-13.0	Extremely Flammable

(1) These components should be stored in accordance with *The Dangerous Substances and Explosive Atmospheres Regulations 2002*.

2.5 EPDM flashing rolls should be stored in a clean, dry position and in temperatures between 5°C and 25°C. The flashing cures gradually and should not be stored for more than six to nine months. As the flashing cures it will become less flexible and although this does not affect its waterproofing characteristics it does become more difficult to form at details.

2.6 Bonding adhesive, Splicing Cement EP95, Lap Sealant, In-seam Sealant, Water Cut-off Mastic and Colour coating should be stored in a dry place in temperatures between 5°C and 25°C. Site storage of these products should not exceed six months.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on ClassicBond Non-reinforced EPDM.

Design Considerations

3 General

3.1 ClassicBond Non-reinforced EPDM are satisfactory for use as:

- a loose-laid and ballasted waterproofing layer, mechanically fastened at edges and upstands, on flat roofs up to a maximum fall of 1:6 with limited access
- a fully adhered waterproofing layer, mechanically fastened at edges and upstands, on flat and pitched roofs with limited access
- a loose-laid system to the inverted roof concept, on flat roofs with limited access.

3.2 Limited access roofs are defined for the purpose of this Certificate as those roofs subjected only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc. Where traffic in excess of this is envisaged additional protection to the membrane must be provided.

3.3 Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 1:80. For design purposes, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls, etc. Pitched roofs are defined for the purpose of this Certificate as those having a fall in excess of 1:6.

3.4 Decks to which the membrane is to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 2005 and, where appropriate, *NHBC Standards 2011*, Chapter 7.1.

3.5 Contact with bituminous, coal tar and oil-based products must be avoided as the membrane is incompatible with lower grades of bitumen. If contact with such products is likely, a separating layer must be interposed before installing the waterproof sheet. Where doubt arises, the advice of the Certificate holder should be sought.

3.6 Insulation systems or materials used in conjunction with the product must be approved by the Certificate holder and either:

- as described in BS 8217 : 2005, or
- the subject of a current BBA Certificate and be used in accordance with, and within the limitations of, that Certificate.

3.7 If rigid glassfibre or mineral wool roof insulation products are used they must be overlaid with 13 mm thick fibreboard unless otherwise authorised by the Certificate holder.

4 Practicability of installation

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

5 Weathertightness



5.1 The systems, including joints, when completely sealed and consolidated will adequately resist the passage of moisture into the building and enable a roof to comply with the requirements of the national Building Regulations (see section 15, Tables for *Physical properties* and *Joints*):

England and Wales — Approved Document C, Requirement C2(b), Section 6

Scotland — Mandatory Standard 3.10, clauses 3.10.1 and 3.10.7

Northern Ireland — Regulation C4(b).

5.2 The membranes are impervious to water and will achieve a weathertight roof capable of accepting minor structural movement (see section 15, Table for *Physical properties*).

6 Properties in relation to fire



6.1 When tested in accordance with BS 476-3 : 1958:

- a system comprising a single layer of ClassicBond Non-reinforced EPDM (1.14 mm thick) on a 19 mm thick chipboard substrate, protected by a nominal 25 mm layer of stone chippings, achieved an EXT.F.AA rating
- a system comprising a single layer of ClassicBond Non-reinforced EPDM (1.52 mm thick) adhered, using Bonding adhesive 90.8.30A, to a 38 mm thickness of polyisocyanurate foam on a profiled steel substrate, achieved an EXT.F.AB rating.

6.2 When used in a loose-laid and ballasted specification including a minimum surface finish of 50 mm of aggregate, the membranes shall be deemed to satisfy BS 476-3 : 1958 designation EXT.F.AA.

6.3 The designation of other specifications should be confirmed by:

England and Wales — Test or assessment in accordance with Approved Document B, Appendix A, clause 1

Scotland — Tests to conform to Mandatory Standard 2.8, clause 2.8.1

Northern Ireland — Test or assessment by a UKAS accredited laboratory or an independent consultant with appropriate experience.

7 Resistance to wind uplift

7.1 The adhesion of adhered systems is sufficient to resist the effects of wind suction, thermal cycling or other minor structural movements likely to occur in service. Where any doubt exists regarding suitability of substrate, the advice of the Certificate holder should be sought.

7.2 Where the membrane is adhered to insulation boards, the resistance to wind uplift will be dependent on the cohesive strength of the insulation and the method by which it is secured to the roof deck. This must be taken into account when selecting a suitable insulation material.

7.3 The ballast requirements for loose-laid and ballasted systems should be calculated in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and the UK National Annex. The membrane should always be ballasted with a minimum depth of 50 mm of aggregate. In areas of high wind exposure, the Certificate holder's advice should be sought. Alternatively, concrete slabs on suitable supports can be used.

8 Resistance to foot traffic

Results of tests indicate that the systems can accept the limited foot traffic and light concentrated loads associated with installation and maintenance. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads. Where traffic in excess of this is envisaged, such as maintenance of lift equipment, a layer of 8 mm thick SBR Walkway sheeting should be provided in accordance with the Certificate holder's instructions (see section 15, Table for *Physical properties*).

9 Maintenance



9.1 Systems must be the subject of annual inspections and maintenance to ensure continued performance.

9.2 Maintenance should include checks and operations to ensure the following where applicable:

- adequate ballast is in place and evenly distributed over the membrane
- protection layers are in good condition
- exposed membrane is free from the build-up of silt and other debris and unwanted vegetation are cleared.

9.3 Where damage has occurred then it should be repaired in accordance with section 14 and the Certificate holder's instructions.

10 Durability



Accelerated weathering tests and evidence from use in the USA and Europe confirm that satisfactory retention of physical properties is achieved. Under normal conditions, ClassicBond Non-reinforced EPDM will have a service life in excess of 20 years (see section 15, Tables for *Physical properties* and *Joints*).

Installation

11 General

11.1 Installation of ClassicBond Non-reinforced EPDM must be carried out by trained installers, in accordance with the manufacturer's instructions and this Certificate.

11.2 Substrates to which the systems are applied must be sound, dry, clean, and free from sharp projections such as nail heads, and concrete nibs. When the systems are to be laid on a rough substrate, a loose-laid, non-woven polyester fleece (minimum 150 g·m⁻²) must be placed over the substrate.

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

11.4 Where contact with low-grade bitumen, coal tar or oil-based products is likely, an isolating layer should be interposed between the product and the substrate. If compatibility with other products is in doubt, the advice of the Certificate holder should be sought.

11.5 The membrane must be mechanically fastened around the perimeter of the roof and around any penetration of the sheet, using fastening plates or reinforced universal securement strip (RUSS).

11.6 When using a loose-laid specification, account should be taken in the design of the deck of the extra dead loading due to the weight of the aggregate.

12 Procedure

Loose-laid and ballasted

12.1 The 1.1 mm thick EPDM membranes may be used for the loose-laid application, but only on roofs with a fall of between 1:80 and 1:6.

12.2 The membrane is mechanically fastened around the perimeter and penetrations (see section 11.6). Lap jointing and flashing is carried out as detailed in sections 13.1 to 13.7 (seaming procedure), and sections 13.8 to 13.10 (flashing).

12.3 Loose-laid applications should be covered by at least 50 mm of river-washed, well-rounded gravel. If crushed stone ballast is used, a protective sheet should be laid between the membrane and the aggregate. In areas of high wind exposure, paving slabs may be considered for use at a distance of one metre from the perimeter, to avoid damage to the membranes due to wind uplift.

12.4 An alternative method of ballasting is to use concrete paving, maximum size 600 mm by 600 mm. A protective sheet (minimum 150 g·m⁻²) must be laid between the EPDM and the supports.

12.5 When the membrane is to be laid directly onto a concrete deck, a protective sheet must be laid first. This is not required if insulation, a minimum of 19 mm thick, is to be laid immediately under the membrane. When used as the waterproofing layer in a roof designed to the inverted roof concept, a protective sheet must be laid between the concrete deck and the membrane.

Fully adhered

12.6 The membrane is used for fully adhered applications on roofs with a minimum finished fall in excess of 1:80.

12.7 All insulation boards are attached to the structural deck by bitumen bond, adhesives, or mechanical fasteners as appropriate to the type and thickness.

12.8 When used as a fully adhered system, the resistance to wind uplift will be limited by the cohesive strength of the insulation and the method of attachment. These factors should be taken into account when selecting the insulation material. Polyurethane insulation boards must be mechanically fixed, bonded in a polyurethane adhesive or bitumen bonded to prevent bowing.

12.9 The fully adhered application may not be used directly onto insulation materials (eg polystyrene) which would be adversely affected by the solvent in the adhesive, or onto bituminous materials, without consulting the manufacturer.

12.10 A layer of bonding adhesive is applied to both the substrate and the membrane by means of a roller at an application rate of 0.75 l·m⁻². When the adhesive has reached its tacky point the membrane is applied to the substrate and rolled to ensure a full bond and that no air has been trapped beneath the membrane.

12.11 The membrane is then mechanically fastened around the perimeter and penetrations (see section 11.5). The laps are sealed and the flashing installed (see sections 13.1 to 13.7 and sections 13.8 to 13.10).

13 Details

Seaming procedure (Splicing Cement)

13.1 At laps, the top sheet should be folded back by about 300 mm and both surfaces of the lap cleaned with Splice Cleaner, HP-250 Primer or LV-600 Primer. Splicing Cement is applied to both surfaces by roller to give an even coverage, and must be allowed to dry until tacky. A continuous 4 mm bead of In-seam Sealant is applied 12 mm in from the back edge of the splice. The top sheet is rolled back down towards the bottom sheet and mated firmly by applying hand pressure.

13.2 The lap should be rolled with a steel or silicone roller, applying positive pressure, towards the outer edge of the lap. The edge should be cleaned using Splice Cleaner. After checking that a good seal has been achieved, a bead of Lap Sealant is applied to the exposed edge of the lap.

Seaming procedure (SecurTape)

13.3 Dirt and excess dust is cleaned from the area of the splice in accordance with the Certificate holder's instructions. The area is then cleaned using either HP-250 or LV-600 Primer, and allowed to dry.

13.4 The bottom sheet is marked 13 mm from the edge of the top sheet along the entire length of the splice. The tape is aligned with the marked line and pressed down using firm, even hand pressure, leaving the top release liner in place.

13.5 The minimum splice width should be 50 mm, with a minimum of 3 mm of tape extending beyond the splice edge.

13.6 The top release liner is removed and the top sheet is allowed to fall freely onto the exposed tape. The top sheet is pressed onto the tape using firm, even hand pressure across the splice towards the outer edge of the lap.

13.7 The lap should be rolled with either a steel or silicone roller, applying positive pressure, towards the outer edge of the lap, and not parallel to it. For lap joints at details, the edge should be cleaned using Splice Cleaner, and a bead of Lap Sealant applied to the exposed edge of the lap.

Seaming procedure (FAT)

13.8 The rolls are laid out in accordance with the Certificate holder's instructions. The release film on the tape is removed and the splice primed prior to consolidation of the joint.

Flashing

13.9 Concurrently with the installation of the EPDM membrane, the EPDM flashing should be applied. The flashing should first be bonded to the horizontal EPDM membrane and lapped, according to the procedure in sections 13.1 to 13.7, with minimum lap widths of 75 mm. A continuation of the deck membrane may be used for flashing, as is the practice when RUSS strip is used.

13.10 The flashing should be adhered to the vertical surface of the wall (see section 12.11) using bonding adhesive or, alternatively, using the pressure-sensitive flashings.

13.11 The flashing is mechanically fastened at its upper edge and protected by dressing back to the wall and covering with coping stones, or by the use of a counter-flashing.

13.12 Advice for specific flashing requirements is available from the manufacturer.

14 Repair

In the event of accidental damage, repairs can be carried out by cleaning the area around the damage and applying a patch of the product as prescribed in the Certificate holder's instructions (see section 12).

15 Tests

Results of test data were assessed and evaluated by the BBA, these are summarised in Tables 2 and 3.

Table 2 Physical properties

Test ⁽¹⁾ (units)	Mean result	Method
Water vapour transmission ($\text{g}\cdot\text{m}^{-2}\cdot\text{day}^{-1}$)	0.3	BS 3177 (25°C/75% RH)
Water vapour resistance ($\text{MN}\cdot\text{s}\cdot\text{g}^{-1}$)	683	BS 3177 (25°C/75% RH)
Tensile strength (MPa)		BS 903-A2
unaged	11.3	
heat aged ⁽²⁾	11.6	
Elongation (%)		BS 903-A2
unaged	450	
heat aged ⁽²⁾	280	
Modulus at 300% elongation (MPa)	7.9	BS 903-A2
Tear resistance (nail) ($\text{N}\cdot\text{mm}^{-2}$)	45	MOAT 27 : 5.4.1
Tear strength ($\text{N}\cdot\text{mm}^{-1}$)		BS 903-A3
unaged	39.9	
heat aged ⁽²⁾	39.4	
Low temperature flexibility ⁽³⁾	pass	BS 903-A25
Dimensional stability (%)		<i>ad hoc</i>
longitudinal	-0.3	
transverse	-0.6	
Ozone resistance x 7 magnification	no cracks	BS 903-A43
UV resistance ⁽⁴⁾	no cracks or crazing	ASTM G 26
Static loading		MOAT 27 : 5.1.9
concrete substrate		
1.14 mm	L_4	
1.52 mm	L_4	
perlite		
1.14 mm	L_4	
1.52 mm	L_4	
Dynamic impact ⁽⁵⁾		MOAT 27 : 5.1.10
concrete substrate	I_3	
perlite substrate	I_4	
Fatigue cycling	pass	MOAT 27 : 5.1.8

(1) Test performed on 1.52 mm nominal thickness membrane except where marked.

(2) Heat aged for 28 days at 116°C.

(3) Using a 10 mm diameter mandrel at -40°C.

(4) UV ageing 4000 light hours at 80°C using Xenon arc.

(5) 1.14 mm tested.

Table 3 Joints

Test (units)	Mean result	Method
Tensile strength of joints (N per 50 mm)		MOAT 27 : 5.2.2/3/4
Splicing Cement		
control	328	
heat aged ⁽¹⁾	357	
Secur Tape (HP-250) ⁽²⁾		
control	279	
heat aged ⁽¹⁾	311	
water soak ⁽³⁾	286	
Secur Tape (LV-600) ⁽²⁾		
control	310	
T-peel ($\text{N}\cdot\text{mm}^{-1}$)		MOAT 46 : 6P
HP-250	1.87	
LV-600	1.90	

(1) Heat aged 28 days at 80°C.

(2) Primer used in preparation of joints.

(3) Water soak 7 days at 60°C.

16 Investigations

- 16.1 Existing data on fire performance of the membrane were assessed.
- 16.2 Existing test results and data from a previous assessment of the membrane were reassessed in the context of UK roofing practice and current building regulations.
- 16.3 A user survey was performed to assess the performance of the membrane in the UK.
- 16.4 Results of test data on the jointing system conducted by UBAtc were assessed.

Bibliography

- BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*
- BS 903-A2 : 1995 *Physical testing of rubber — Method for determination of tensile stress-strain properties*
- BS 903-A3 : 1995 *Physical testing of rubber — Method for determination of tear strength (trouser, angle and crescent test pieces)*
- BS 903-A25 : 1992 *Physical testing of rubber — Determination of low-temperature brittleness*
- BS 903-A43 : 1990 *Physical testing of rubber — Method for determination of resistance to ozone cracking (static strain test)*
- BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*
- BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*
- BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*
- BS EN 1991-1-4 : 2005 *Eurocode 1 : Actions on structures — General actions — Wind actions*
- NA to BS EN 1991-1-4 : 2005 *UK National Annex to Eurocode 1 : Actions on structures — General actions — Wind actions*
- ASTM G 26 : 1996 *Practice for operation of light exposure equipment (Xenon-arc type) with and without water for exposure of non-metallic materials*
- MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*
- MOAT No 46 : 1988 *Special Directives for the Assessment of Roof Waterproofing Systems with Non-reinforced Vulcanized EPDM*

17 Conditions

17.1 This Certificate:

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

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

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

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

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

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

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

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