

## Carlisle Syntec Incorporated

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Agrément Certificate  
**92/2791**  
Product Sheet 3

### CARLISLE SYNTEC SYSTEMS

### CARLISLE SURE-WELD ROOF WATERPROOFING SYSTEMS

#### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Carlisle Sure-Weld Roof Waterproofing Systems, for use as a mechanically fastened or fully adhered, loose-laid and ballasted waterproofing layer on flat or pitched roofs with limited access.

#### 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




Date of Second issue: 7 July 2011

Simon Wroe

Greg Cooper

Originally certificated on 24 March 1998

Head of Approvals — Materials

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](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, Carlisle Sure-Weld Roof Waterproofing Systems, 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)

<b>Requirement:</b> B4(2)	<b>External fire spread</b>
<b>Comment:</b>	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.
<b>Requirement:</b> C2(b)	<b>Resistance to moisture</b>
<b>Comment:</b>	The systems, including joints, will enable a roof to meet this Requirement. See section 5.1 of this Certificate.
<b>Requirement:</b> Regulation 7	<b>Materials and workmanship</b>
<b>Comment:</b>	The systems are acceptable. See section 10 and the <i>Installation</i> part of this Certificate.



## The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b> 8(1)(2)	<b>Fitness and durability of materials and workmanship</b>
<b>Comment:</b>	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.
<b>Regulation:</b> 9	<b>Building standards – construction</b>
<b>Standard:</b> 2.8	<b>Spread from neighbouring buildings</b>
<b>Comment:</b>	The systems when applied to a suitable substrate are regarded as having low vulnerability under clause 2.8.1 <sup>(1)(2)</sup> of this Standard. See sections 6.1 to 6.3 of this Certificate.
<b>Standard:</b> 3.10	<b>Precipitation</b>
<b>Comment:</b>	The systems, including joints will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 <sup>(1)(2)</sup> and 3.10.7 <sup>(1)(2)</sup> . See section 5.1 of this Certificate.
<b>Standard:</b> 7.1(a)	<b>Statement of sustainability</b>
<b>Comment:</b>	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.
<b>Regulation:</b> 12	<b>Building standards – conversions</b>
<b>Comment:</b>	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 <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)

<b>Regulation:</b> B2	<b>Fitness of materials and workmanship</b>
<b>Comment:</b>	The systems are acceptable. See section 10 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> B3(2)	<b>Suitability of certain materials</b>
<b>Comment:</b>	The membranes are acceptable. See sections 9.1 and 9.2 of this Certificate.
<b>Regulation:</b> C4(b)	<b>Resistance to ground moisture and weather</b>
<b>Comment:</b>	The systems, including joints, will enable a roof to satisfy the requirements of this Regulation. See section 5.1 of this Certificate.
<b>Regulation:</b> E5(b)	<b>External fire spread</b>
<b>Comment:</b>	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* (1.2) 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 Carlisle Sure-Weld Roof Waterproofing Systems, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 7.1 *Flat roofs and balconies*.

## General

The product is manufactured in the USA by Carlisle SynTec Systems and marketed in the UK by Icopal Limited, Barton Dock Road, Stretford, Manchester M32 0YL, tel: 0161-865 4444, fax: 0161-866 9859.

A list of trained and approved operatives is available from the UK marketing company.

## Technical Specification

### 1 Description

1.1 Carlisle Sure-Weld are welt-inserted thermoplastic polyolefin (TPO) membranes manufactured by extrusion, and laminating by calendaring. Grades with other fire performance ratings are available on request. Carlisle Sure-Weld Plus is an enhanced fire performance grade.

1.2 The nominal characteristics of the membranes are:

Thickness (mm)	1.2
Width (m)	1.2, 1.5, 3.0 and 3.6
Length (m)	30.5
Mass per unit area (kg·m <sup>-2</sup> )	1.18
Colour	dark grey, white and light grey

1.3 Ancillary items for use with these systems are:

- Coated metal — a 0.9 mm thick layer of Sure-Weld factory laminated to a 0.6 mm thick galvanized steel sheet, for use in detailing
- PS Coverstrip — a 150 mm wide, self-adhesive strip of membrane, for use in detailing
- Water Cut-off Mastic — for non-exposed compression seals, ie drains and termination bars
- CCW-102C — a one-part, moisture-curing polyurethane-based sealer for filling penetration pockets and sealing other miscellaneous penetrations
- HP Protective mat — a 180 g·m<sup>-2</sup> UV stabilised, rot-resistant mat for use as a protection layer between crushed stone or paver ballast
- Termination Bar — an extruded aluminium bar for securing the perimeters of the waterproofing
- Sure-Weld Cleaner — a cleaning agent for the preparation of welding areas
- Preformed Details — flashings, corners and pipe sleeves manufactured from unreinforced TPO
- Sure-Weld Bonding Adhesive — a polychloroprene adhesive for use in bonding membranes in fully-adhered specifications
- Fasteners and fastening plates — for use in mechanically fixed applications
- Pourable sealer — a two-component, solvent-free, polyurethane-based sealant, for use in areas where flashing is difficult to apply
- TPO RUSS strip — a reinforced TPO 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.

1.4 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, packed on pallets. 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:

Sure-Weld Bonding Adhesive	16 kg
Water Cut-off Mastic	10-tube cartons
CCW-102C	24-cartridge cartons
Sure-Weld Cleaner	3.78 litre tins

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 Sure-Weld <sup>(1)</sup>	-20.0	Extremely Flammable, Harmful
Water Cut-off Mastic <sup>(1)</sup>	-10	Highly Flammable, Harmful
CCW-102C <sup>(1)</sup>	4.8	Flammable, Harmful
Sure-Weld Cleaner <sup>(1)</sup>	46	Flammable, Harmful

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

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Carlisle Sure-Weld Roof Waterproofing Systems.

### Design Considerations

#### 3 General

3.1 Carlisle Sure-Weld Roof Waterproofing Systems are satisfactory for use as loose-laid and ballasted waterproofing layer on flat roofs and mechanically fastened or fully adhered on flat or pitched 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 — general*):

**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 — directional*).

## 6 Properties in relation to fire



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

- a system comprising a 0.7 mm thick profiled galvanized steel deck, a 250 µm thick polyethylene vapour control layer, a 40 mm thick aluminium foil-faced polyurethane insulation and a mechanically fastened layer of 1.2 mm thick Sure-Weld Plus TPO achieved on EXT.F.AA rating
- a system comprising a 0.7 mm thick profiled galvanized steel deck, a 250 µm thick polyethylene vapour control layer, a mechanically fastened 50 mm thick polyisocyanurate insulation board, and a fully adhered layer of 1.2 mm thick Sure-Weld, using Sure-Weld Bonding Adhesive at a coverage rate of 1.45 m<sup>2</sup>·l<sup>-1</sup>, achieved a rating of EXT.F.AC.

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

### Mechanically fastened

7.1 The resistance to wind uplift of a mechanically fastened waterproofing layer is provided by the fasteners passing through the membrane into the substrate. The number and position of fixings will depend on a number of factors including:

- wind uplift forces to be restrained
- pull-out strength of the fasteners
- tensile properties of the membrane
- appropriate calculation of safety factors.

7.2 The wind uplift forces are calculated in accordance with BS EN 1991-1-4 : 2005 and the UK National Annex to establish the number of fixings and the pattern in which they are to be employed.

7.3 The Certificate holder offers a design service which takes into account all the relevant supplied information.

Assistance is provided when preparing drawings for the position of fixings, type of screws to be used, and the number of fixings required.

### Fully bonded

7.4 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.

7.5 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.

### Loose-laid and ballasted

7.6 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 — directional*).

## 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 confirm that satisfactory retention of physical properties is achieved. Under normal conditions, Carlisle Sure-Weld Roof Waterproofing Systems will have a service life in excess of 20 years (see section 15, Tables for *Physical properties — directional* and *Physical properties — general*).

## Installation

### 11 General

11.1 Installation of Carlisle Sure-Weld Roof Waterproofing Systems 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.

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 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 membrane should be unrolled onto the substrate, without folds or ripples, with 75 mm side and end laps.

12.2 The membrane is mechanically fastened around the perimeter and penetrations (see section 12.6). Lap jointing and flashing is carried out as detailed in sections 13.1 to 13.4 (welding procedure), and sections 13.5 to 13.7 (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, an HP Protective mat or similar 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. An HP Protective mat or similar sheet must be laid between the membrane and the pavers as a minimum protection.

12.5 When using a loose-laid application, account should be taken in the design of the deck for the extra loading due to the weight of the aggregate.

#### Mechanically fastened

12.6 The membrane should be unrolled onto the substrate, without folds or ripples, with 125 mm side and 75 mm end overlaps. The field sheets should stop short of both ends of the roof to allow installation of the perimeter sheets. The perimeter sheets should overlap the field sheets by 125 mm.

12.7 The membrane is fixed to the deck (through insulation boards, where appropriate) in the joint overlaps and at the ends of the field sheets where overlapped by the perimeter sheets prior to welding of the seams.

12.8 The fastener assembly should be a minimum of 13 mm in from the edge of the lower membrane. Spacing between fasteners is determined by required wind resistance in accordance with Certificate holder's instructions.

#### Fully adhered

12.9 The membrane is unrolled onto the substrate, without folds or ripples, with a minimum overlap of 50 mm. The membrane is folded back so half the underside surface is exposed.

12.10 Sure-Weld Bonding Adhesive is thoroughly stirred prior to application, a minimum five minutes stirring is recommended.

12.11 The adhesive is applied evenly to both the underside of the membrane and the substrate at an approximate total application rate of 1.45 m<sup>2</sup>·l<sup>-1</sup>. Both bonding surfaces must be dry and clean. Adhesive should not be applied along the splice edge of the membrane to be hot-air welded over the adjoining sheet.

12.12 The adhesive is allowed to dry until it is tacky and the membrane is applied to the coated substrate, avoiding wrinkles, and brushed down with a soft bristle broom to achieve maximum contact.

12.13 The other half of the membrane is folded back and the procedure repeated.

12.14 Lap joints are produced by hot-air welding as described in sections 13.1 to 13.4.



## 13 Details

### Welding procedure

13.1 Joints are produced by hot-air welding — automatic welders are recommended for the main roof areas and hand-held welders for detailing and inaccessible areas.

13.2 If necessary, the weld area should be cleaned prior to welding, using Sure-Weld Cleaner, and allowed to dry.

13.3 Test welds should be made prior to welding to ensure the automatic welder temperature and speed are set to produce the optimum welds.

13.4 After the weld has cooled, it should be probed to check for integrity and any repairs carried out using a handheld welder and roller.

### Flashing

13.5 Surfaces receiving flashing must be dry and smooth. Any surface that is rough or cannot achieve 75% adhesion must be faced with a minimum of 12 mm exterior grade plywood or similar. Stucco, gypsum, corrugated metal or irregular stone substrates should always be faced.

13.6 Flashing is bonded using Sure-Weld Bonding Adhesive. The coverage rate will vary depending on the substrate and weather conditions, in cases of doubt the advice of the Certificate holder should be sought.

13.7 The termination of all flashings should be mechanically fixed with fasteners at a maximum of 300 mm centres.

## 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).

## Technical Investigations

## 15 Tests

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

15.2 Characterisation tests were also carried out for:

- thickness
- mass per unit area
- ash content
- infra-red spectroscopy.

*Table 2 Physical properties — directional*

Test (units)	Mean result		Method
	Longitudinal	Transverse	
Tensile strength (N per 50 mm <sup>-1</sup> )			MOAT 60 : 4.8.1 (200 mm·min <sup>-1</sup> )
unaged	1502	1434	
heat aged <sup>(1)</sup>	1510	1432	
UV aged <sup>(2)</sup>	1352	1307	
water soak <sup>(3)</sup>	1294	1175	
bitumen compatibility <sup>(4)</sup>	902	1186	
Elongation at break (%)			MOAT 60 : 4.8.2 (200 mm·min <sup>-1</sup> )
unaged	174	459	
heat aged <sup>(1)</sup>	166	356	
UV aged <sup>(2)</sup>	274	407	
water soak <sup>(3)</sup>	272	647	
bitumen compatibility <sup>(4)</sup>	339	407	
Resistance to tearing (N)			MOAT 55 : 4.231
-10°C	589	749	
18°C	708	792	
40°C	481	487	
Low temperature flexibility <sup>(5)</sup> (°C)			MOAT 27 : 5.4.2
unaged	≤-20	≤-20	
heat aged <sup>(1)</sup>	≤-20	≤-20	
UV aged <sup>(2)</sup>	≤-20	≤-20	
Dimensional stability (free) (%)	-0.26	-0.03	MOAT 27 : 5.1.6.1
Tear strength (N·mm <sup>-1</sup> )	167	234	BBA method <sup>(6)</sup>
Cold flex (°C)	-41	-38	BS 2782-1.150B

(1) Heat aged for 90 days at 80°C.

(2) UV aged 1000 light hours using UVB 313 lamps on a cycle of 4 hours light at 45°C/4 hours condensation at 50°C.

(3) Water soak for 28 days at 23°C.

(4) Exposed to bitumen for 91 days at 50°C.

(5) Lowest temperature tested -20°C.

(6) BBA test method based on BS 2782-3.360B : 1980 (superseded) for tear strength using trouser test piece.

*Table 3 Physical properties — general*

Test (units)	Mean result	Method
Water vapour transmission ( $\text{g}\cdot\text{m}^{-2}\cdot\text{day}^{-1}$ )	0.25	BS 3177 (25°C/75% RH)
Water vapour resistance ( $\text{MN}\cdot\text{s}\cdot\text{g}^{-1}$ )	821	BS 3177 (25°C/75% RH)
Resistance to water pressure <sup>(1)</sup>	pass	MOAT 27 : 5.1.4
Static indentation		MOAT 27 : 5.1.9
rigid	L <sub>4</sub>	
compressive	L <sub>4</sub>	
Dynamic indentation		MOAT 27 : 5.1.10
perlite cellulose	I <sub>3</sub>	
expanded polystyrene	I <sub>3</sub>	
Peel (N)		MOAT 27 : 5.1.3
unaged	88	
heat aged <sup>(2)</sup>	15	
water soak <sup>(3)</sup>	16	
Leakage at joints	pass	MOAT 27 : 5.2.1
Tensile strength (shear) of joints (N)		MOAT 27 : 5.2.2./3/4
unaged	709	
heat aged <sup>(4)</sup>	869	
Peel strength of joints (N per 50 mm)		MOAT 46 : 6P
unaged	229	
heat aged <sup>(4)</sup>	179	
exposure <sup>(5)</sup>	239	

(1) Carried out on joint.

(2) Heat aged 28 days at 70°C.

(3) Water soak 28 days at 30°C.

(4) Heat aged for 28 days at 80°C.

(5) Joint made after membrane 7 days natural exposure.

## 16 Investigations

16.1 Existing data on fire performance to BS 476-3 : 1958 of the product were assessed.

16.2 The manufacturing processes were assessed, including methods of quality control.

16.3 A visit to a site in progress was carried out to assess the method of application.

16.4 Results of wind uplift data on mechanically fixed systems from WSP Aachen, tested in accordance with MOAT No 55 : 1991, were assessed.

16.5 A user survey was performed to assess the performance of the membrane in the UK.



## Bibliography

- BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*
- BS 2782-1.150B : 1976 *Methods of testing plastics — Thermal properties — Determination of cold flex temperature of flexible polyvinyl compound*
- BS 2782-3.360B : 1980 *Methods of testing plastics — Mechanical properties — Determination of tear strength of sheet and sheeting (trouser tear method)*
- BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*
- BS 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*
- 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*
- MOAT No 55 : 1991 *UEAtc Supplementary guide for the assessment of mechanically fastened roof waterproofing*
- MOAT No 60 : 1997 *UEAtc Technical Guide for the approval of reinforced and/or backed roof waterproofing systems made of plasticised PVC Sheetting incompatible with bitumen*

## 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.