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Agrément Certificate

94/3037

Product Sheet 1

AXTER BITUMEN ROOF WATERPROOFING SYSTEMS

EXCEL ROOF WATERPROOFING SYSTEMS

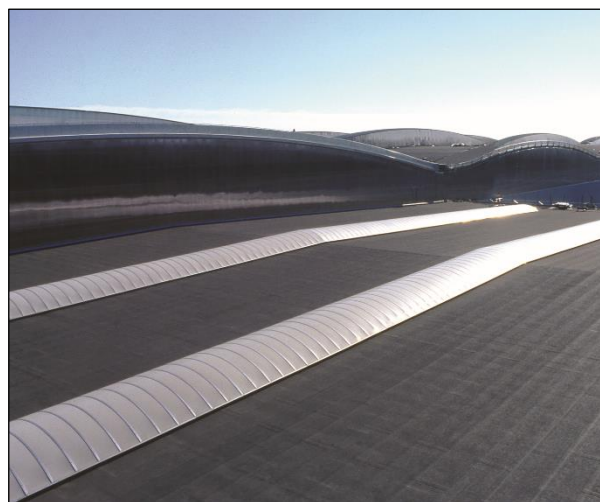
This Agrément Certificate Product Sheet⁽¹⁾ relates to Axter Excel Roof Waterproofing Systems, Alpa⁽²⁾ polymer-modified self-finished bitumen waterproofing membranes and styrene-butadiene-styrene (SBS) polymer-modified underlays, for use, fully or partially bonded, in a flame free hot air welded, mechanically fixed or torch-applied application, on flat, pitched roof and protected zero fall specifications.

(1) Hereinafter referred to as 'Certificate'.

(2) Alpa is a registered trademark.

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 into the interior of a building (see section 6).

Properties in relation to fire — the systems, when used in a suitable specification may enable a roof to be unrestricted under the national Building Regulations (see section 7).

Resistance to wind uplift — the systems will resist the effects of any likely wind suction acting on the roof (see section 8).

Resistance to mechanical damage — the systems will accept the limited foot traffic and loads associated with installation and maintenance and the effects of thermal or other minor movement likely to occur in practice (see section 9).

Durability — under normal service conditions, the systems will provide a durable roof waterproofing with a service life in excess of 25 years (see section 11).

The BBA has awarded this 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 Fourth issue: 19 January 2022

Originally certificated on 05 July 1994

Hardy Giesler
Chief Executive Officer

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 MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

British Board of Agrément

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Regulations

In the opinion of the BBA, Axter Excel Roof Waterproofing Systems, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	B4(1)	External fire spread
Comment:	The systems are restricted by this Requirement in some circumstances. See section 7.5 of this Certificate.	
Requirement:	B4(2)	External fire spread
Comment:	On suitable substructures, the use of the systems may enable a roof to be unrestricted under this Requirement: See sections 7.1, 7.2, 7.3 (Wales only) and 7.4 of this Certificate.	
Requirement:	C2(b)	Resistance to moisture
Comment:	The membranes, including joints, will enable a roof to satisfy this Requirement. See section 6 of this Certificate.	
Regulation:	7(1)	Materials and workmanship
Comment:	The systems are acceptable. See section 11.1 and the <i>Installation</i> part of this Certificate.	



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:	The use of the systems can satisfy the requirements of this Regulation. See sections 10.1 and 11.1 and the <i>Installation</i> part of this Certificate.	
Regulation:	9	Building standards applicable to construction
Standard:	2.6	Spread to neighbouring buildings
Comment:	The systems are restricted under clause 2.6.4 ⁽¹⁾⁽²⁾ of this Standard in some circumstances. See section 7.6 of this Certificate.	
Standard:	2.8	Spread from neighbouring buildings
Comment:	The systems, when applied to a suitable substructure, may enable a roof to be unrestricted under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 7.1, 7.2 and 7.4 of this Certificate.	
Standard:	3.10	Precipitation
Comment:	The membranes, including joints, will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.2 ⁽¹⁾⁽²⁾ . See section 6 of this Certificate.	
Standard:	7.1(a)	Statement of sustainability
Comment:	The systems can contribute to satisfying 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 applicable to conversions
Comment:	Comments 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) 2012 (as amended)

Regulation:	23(a)(i)	Fitness of materials and workmanship
Comment:	(iii)(b)(i)	The systems are acceptable. See section 11.1 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The membranes, including joints, will enable a roof to satisfy the requirements of this Regulation. See section 6 of this Certificate.
Regulation:	36(b)	External fire spread
Comment:		On suitable substructures, the use of the systems may be unrestricted by the requirements of this Regulation. See sections 7.1 to 7.4 of this Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 1 *Description* (1.2) and 3 *Delivery and site handling* (3.3) of this Certificate.

Additional Information

NHBC Standards 2022

In the opinion of the BBA, Axter Excel Roof Waterproofing Systems, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 7.1 *Flat roofs, terraces and balconies*.

The NHBC Standards do not cover the use of the systems in the refurbishment of existing roofs.

CE marking

The Certificate holder has taken the responsibility of CE marking the systems, in accordance with harmonised European Standard EN 13707 : 2013.

Technical Specification

1 Description

1.1 Axter Excel Roof Waterproofing Systems comprise the following waterproofing membranes (capsheets and underlayers):

- Axter Excel — Alpa polymer-modified bitumen, torch-applied or flame free hot air welded, ceramic granule or mineral slate finished capsheet, reinforced with 180 g·m⁻² stabilised polyester
- Axter Force Solo — Alpa polymer-modified bitumen, torch-applied or flame free hot air welded, ceramic granule or mineral slate finished capsheet, reinforced with 180 g·m⁻² stabilised polyester
- Axter Excel FM — Alpa polymer-modified bitumen mechanically fixed ceramic granule or mineral slate finished capsheet, reinforced with 180 g·m⁻² stabilised polyester
- Axter Excel Plus - Alpa polymer-modified bitumen, torch-applied or flame free hot air welded, ceramic granule or mineral slate finished capsheet, reinforced with 180 g·m⁻² stabilised polyester
- Axter TS CPV — a 120 g·m⁻² polyester reinforced torch-applied underlayer, with sand finished surface and a thermofusible film on the under surface
- Axter SPOT ADH — a 120 g·m⁻² polyester reinforced heat activated self-adhesive underlayer with a macro-perforated film and sand finish surface, and a silicone release film on the under surface

- Axter TS PY — a 180 g·m⁻² polyester reinforced torch-applied intermediate layer with sand finished surface and a thermofusible film on the under surface.
- Axter Excel Solar- Alpa polymer-modified bitumen mechanically fixed, torch-applied or flame free hot air welded, reinforced with 180 g·m⁻² stabilised polyester. The undersurface is a thermofusible film and the surface is a peel-off silicone film specially designed for the attachment of flexible solar cells.

1.2 The nominal characteristics of the membranes are given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Axter Excel and Excel FM	Axter Force Solo	Axter Excel Plus	Axter TS CPV	Axter Spot ADH	Axter TS PY	Axter Excel Solar
Thickness (mm)	4 ⁽¹⁾	4.5 ⁽¹⁾	4.5 ⁽¹⁾	2.65 ⁽²⁾	2.65 ⁽²⁾	2.65 ⁽²⁾	4 ⁽²⁾
Roll width (m)	1	1	1	1	1	1	1
Roll length (m)	8	8	8	7	10	7	8
Nominal roll weight (kg)	41.2	47.1	47.1	24.7	31.6	22.7	42.1
Tensile strength (N per 50 mm)							
longitudinal	600	600	600	400	450	700	600
transverse	600	600	600	275	275	550	600
Elongation at break (%)							
longitudinal	35	35	35	15	15	35	35
transverse	35	35	35	15	15	35	35
Low temperature flexibility (°C)	-14	-14	-14	-16	-16	-16	-14
Heat resistance (°C)	120	120	120	100	100	100	120

(1) On the selvedge.

(2) On the finished product.

1.3 Other materials for use with the systems, but which are outside the scope of this Certificate, are:

- Proofcoat Emulsion — solvent-free primer, for use in preparing substrates prior to installation of torch-applied bitumen membranes and air and vapour control layers (avcl)
- Vernis Antac — primer, for use in preparing substrates prior to installation of torch-applied bitumen membranes and avcl
- Vernis SA — for use in preparing substrates prior to installation of Axter NEO-Bitumen⁽¹⁾ flame free self-adhesive membranes and avcl
- Vernis Seal — synthetic, rapid-drying primer, for use in preparing substrates prior to installation of bitumen membranes and avcl
- Ruberfix — low melting point polymer-modified bitumen mastic for bonding insulation and bitumen membranes
- Bitumseal — cold applied polymer-modified bitumen adhesive and sealant
- Mastic Hyrene — cold applied bitumen adhesive for bonding insulation
- Hyrastik Evo — cold applied polyurethane adhesive for bonding insulation
- ADH Adhesive — cold applied adhesive for bonding bitumen and synthetic membranes
- Hytherm insulation products — a wide range of thermal insulation products. Details are available from the Certificate holder
- Axter Water Flow Reducing Layer (WFRL) — spun bonded polyethylene geotextile installed above inverted roof insulation to minimise heat loss caused by rainwater cooling
- 35 PY Angle Reinforcement — polyester reinforced elastomeric SBS membrane for details reinforcement
- Stickflex PY Angle Reinforcement — Axter NEO-Bitumen flame free polyester reinforced elastomeric SBS membrane for detail reinforcement
- Stickflex PY Peel Stop — Axter NEO-Bitumen flame free polyester reinforced elastomeric SBS membrane installed at perimeter and corner zones in conjunction with Excel FM membrane
- Force 4000 Flame Free — a polymer-modified Axter NEO-Bitumen flame free hot air welded ceramic granule or mineral slate finished capsheet, reinforced with 180g·m⁻² stabilised polyester
- Starcoat R — cold liquid applied single component bitumen resin with anti-root additive for waterproofing complex details
- membrane and insulation fixings and insulated washers — for use in mechanically fixed Excel FM specifications

- Axter Excel 25 Solar — Alpa polymer modified bitumen, torch-applied or flame free hot air welded capsheet, with CIGS flexible photovoltaic modules adhered in situ to membrane surface, reinforced with 50 g·m⁻² glass fibre
- Stickflex Sanded — Axter NEO-Bitumen flame free reinforced elastomeric SBS underlayer membrane with a sand finish surface, and a silicone release film on the under surface
- Force SA — Axter flame free self-adhesive reinforced elastomeric SBS underlayer membrane with a macro-perforated film and sand finish surface, and a silicone release film on the under surface
- cold liquid-applied repair products.

(1) Axter NEO-Bitumen is a registered trademark.

2 Manufacture

2.1 The membranes are manufactured by saturating and coating the reinforcement with SBS modified bitumen, then calendaring to correct thickness. The lower and upper surfaces are applied as appropriate and the sheets are cooled, trimmed and rolled for packaging.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Axter Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 and BS EN ISO 14001 : 2015 by AFAQ (Certificates 1996/5190.11 and 2011/40665.3 respectively).

3 Delivery and site handling

3.1 The membranes are delivered to site in rolls bearing the product name and production code, with tape bands. Rolls are packed on pallets and shrink wrapped for security.

3.2 Rolls should be stored upright on a clean, level surface, away from excessive heat and out of direct sunlight.

3.3 The Certificate holder has taken the responsibility of classifying and labelling the systems components under the *CLP Regulation (EC) No 1272 / 2008 on the classification, labelling and packaging of substances and mixtures*. Users must refer to the relevant Safety Data Sheet(s).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Axter Excel Roof Waterproofing Systems.

Design Considerations

4 General

4.1 Axter Excel Roof Waterproofing Systems are satisfactory for use as:

- fully or partially bonded, or mechanically fixed, single- or multi-layer waterproofing for flat, protected zero fall or pitched roofs with limited access, or under heavy protection (eg concrete slab) on flat roofs, terraces, balconies and walkways with regular pedestrian traffic
- a repair and refurbishment waterproofing system for existing roofs as a complete single-or multi-layer overlay where appropriate
- part of a built-up specification, where necessary in conjunction with appropriate Axter reinforced bitumen membranes in accordance with BS 8747 : 2007, BS 8217 : 2005 and BS 6229 : 2018 and warm or inverted roof

insulation on fully or partially bonded flat or pitched roofs with limited access, or under heavy protection (eg concrete slab) on flat roofs, terraces, balconies or walkways with regular pedestrian traffic.

4.2 Decks to which the systems are to be applied must comply with the relevant requirements of either BS 6229 : 2018 or BS 8217 : 2005 and, where appropriate, *NHBC Standards 2021*, Chapter 7.1.

4.3 Limited access roofs are defined for the purpose of this Certificate as those subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters etc. Where traffic in excess of this is envisaged, such as pedestrian access roofs, additional protection to the membrane must be provided (see section 9).

4.4 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of 1:80. When designing flat roofs, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available including overall and local deflection and direction of falls.

4.5 Zero fall roofs are defined as those having a finished fall of between 0 and 1:80. Reference should also be made to the appropriate clauses in Liquid Roofing and Waterproofing Association (LRWA) Note 7 - *Specifier Guidance for Flat Roof Falls*.

4.6 Pitched roofs are defined for the purpose of this Certificate as those having falls greater than 1:6.

4.7 The drainage systems for zero fall roofs must be correctly designed, and the following points should be addressed:

- provision made for access for maintenance purposes
- it is particularly important to identify the correct drainage points, to ensure that drainage is sufficient and effective.

4.8 Insulation materials used in conjunction with the systems must be in accordance with the Certificate holder's instructions and be either:

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

4.9 The NHBC requires that the roof membranes, once installed, are inspected in accordance with *NHBC Standards 2021*, Chapter 7.1, Clause 7.1.12, and undergo an appropriate integrity test, where required. Any damage to the membrane is repaired in accordance with section 15 of this Certificate and reinspected.

5 Practicability of installation

The systems are designed to be installed by competent roofing contractors experienced in the installation of these types of systems and approved by the Certificate holder.

6 Weathertightness



The membranes, including joints, when completely sealed and consolidated, will adequately resist the passage of moisture to the interior of a building and will enable a roof to comply with the requirements of the national Building Regulations.

7 Properties in relation to fire



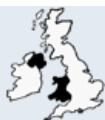
7.1 When tested to DD CEN/TS 1187 : 2012, test 4, assessed to CEN/TS 16459 : 2013 and classified to BS EN 13501-5 : 2016 the following extended field of application⁽¹⁾⁽²⁾⁽³⁾ achieved B_{ROOF}(t4) for slopes up to 10° and will be unrestricted by the requirements of the national Building Regulations with respect to proximity to a boundary:

- Excel/Excel FM/Excel Solar/Force Solo, 4 mm thick, 180 g·m⁻² stabilised polyester reinforced capsheet, mechanically /Hot air/ Torch fixed.
- Hyranger Spot ADH, 2.6 mm thick, 120 g·m⁻² (or less) stabilised polyester reinforced, self-adhesive underlayer (optional)

- PIR insulation 50 mm or more, top coated glass tissue and bottom bitumenised glass tissue with PP fleece, foam density of $30 \text{ kg}\cdot\text{m}^{-3}$, reaction to fire classification of E or better, PU adhered in beads 20 – 30 mm wide with surface coverage of $5 - 10 \text{ m}^2\cdot\text{m}^{-1}$
- bituminous vapour barrier
- OSB substrate, 18 mm or more with a density of $600 \text{ kg}\cdot\text{m}^{-3}$

- (1) Warrington Fire 20295A+B test reports to DD CEN/TS 1187 : 2012, copies are available from the Certificate holder
- (2) Warrington Fire 20295C extended application report to CEN/TS 16459 : 2013, copies are available from the Certificate holder
- (3) Warrington Fire 20295D classification report to BS EN 13501-5: 2016, copies are available from the Certificate holder

7.2 The systems, when used in protected roof specifications, including an appropriate inorganic covering listed in the Annex of Commission Decision 2000/553/EC, can also be considered to be unrestricted with respect to proximity to a boundary.



7.3 In Wales and Northern Ireland, when used on flat roofs with the surface finishes listed below, the roof is also deemed to be unrestricted:

- bitumen-bedded stone chippings covering the whole surface to a depth of not less than 12.5 mm
- bitumen-bedded tiles of non-combustible material
- sand and cement; or
- macadam.



7.4 The designation and permissible areas of use of other specifications should be confirmed by reference to the requirements of the documents supporting the national Building Regulations.



7.5 In England and Wales, the systems, when used in pitches of greater than 70° , should not be used on buildings that have a storey at least 18 m above ground level and which contain: one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house), student accommodation, care homes, sheltered housing, hospitals or dormitories in boarding schools.



7.6 In Scotland, the systems, when used in pitches of greater than 70° , excluding upstands, should not be used on buildings that have a storey more than 11 m above ground level.

8 Resistance to wind uplift

8.1 The adhesion of the bonded systems is sufficient to resist the effects of wind suction, elevated temperatures and thermal shock conditions likely to occur in practice.

8.2 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.

8.3 The wind uplift forces must be calculated by a suitably competent and experienced individual in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. On this basis, the number of fixings required should be established using a maximum permissible load of 0.666 kN per fixing for the systems fixed using SF-T-50 tube washers and SF-RS-5.8 fasteners.

8.4 If other fixings are used in conjunction with the systems, the load per fixing must be assessed and determined by a competent and suitably experienced individual.

9 Resistance to mechanical damage

The systems can accept the limited foot traffic and light concentrated loads associated with installation and maintenance. Where traffic in excess of this is envisaged, additional protection to the systems, eg a walkway, must be provided in accordance with the relevant clauses of the Certificate holder's installation instructions. Care must be taken to avoid puncture by sharp objects, or concentrated loads.

10 Maintenance



10.1 Installations must be the subject of inspections and maintenance in accordance with the recommendations in BS 6229 : 2018, Chapter 7, and the manufacturers own maintenance requirements where relevant to ensure continued satisfactory performance.

10.2 Maintenance should include checks and operations to ensure that the membrane and drainage outlets are free from the build-up of silt and other debris, and that protection layers, eg walkways, are in good condition.

10.3 In the event of the systems being contaminated by oil, grease or other chemicals, the advice of the Certificate holder must be sought.

10.4 Where damage has occurred it should be repaired in accordance with section 15 and the Certificate holder's instructions.

11 Durability



11.1 Under normal service conditions, the systems will provide a durable roof waterproofing with a service life in excess of 25 years.

11.2 Localised loss of the mineral surfacing may occur after some years in areas where complex detailing of the roof design is incorporated.

12 Reuse and recyclability

The systems comprise bituminous compounds, mineral aggregates and glass/polyester, which can be recycled.

Installation

13 General

13.1 Installation of Axter Excel Roof Waterproofing Systems is carried out in accordance with the Certificate holder's instructions, the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989, BS 6229 : 2018 and BS 8217 : 2005, and this Certificate.

13.2 Roof slab or deck surfaces on which the systems are to be installed must be dry, clean and free from sharp projections such as nail heads and concrete nibs.

13.3 The systems must not be laid in rain, snow or heavy fog. If the temperature falls below 5°C, suitable precautions must be taken against the formation of condensation on the roof slab or deck surface.

13.4 Installation of insulation boards must be carried out in accordance with the Insulation Manufacturer's Association (IMA) guidance.

13.5 The waterproof layers must be installed with staggered overlaps. Lap joints must not be less than 75 mm or as recommended by the Certificate holder and must be fully sealed. In multilayer systems, successive lengths of membrane must be laid in the same direction with laps offset between layers to avoid excessive build-up of thickness at side and head laps.

13.6 At falls in excess of 1:11 (5°), precautions against slippage should be observed and provision made for mechanical fixings as required by BS 8217 : 2005. For slopes above 1:6 (10°), the Certificate holder's technical department should be consulted to ensure correct precautions are undertaken.

13.7 On completion of the roof, additional surface protection is not required where the systems are self-protected and has either a ceramic granule or mineral slate finish and is used on roofs with limited access. Otherwise, a surface finish should be applied in accordance with BS 8217 : 2005, Clause 8.19. Surface finishes in the Code of Practice include:

- stone aggregate in dressing compound
- precast concrete paving slabs
- proprietary tiles on bonding compound.

14 Procedure

Fully bonded single and multi-layer applications

14.1 Bonding is achieved by melting the lower surface by torching method and pressing the membrane down. Care must be taken not to overheat the membrane.

14.2 Side laps must be a minimum of 75 mm with end and head laps a minimum of 100 mm. A bead of molten material must exude from all laps to indicate a satisfactory seal.

14.3 The underlayer must be installed to a sufficient height (minimum 150 mm above roof surface) on all upstands, skirtings and protrusions to ensure a secure bonded lap with the avcl is achieved.

14.4 Detailing should be completed in accordance with the Certificate holder's instructions and in compliance with the NFRC Safe2Torch guidance document.

Partially bonded applications

14.5 The torching lines on the underside of the membrane must be heated to a molten state by torching method and the membrane pressed down in order to achieve a partial bond.

14.6 Detailing should be completed in accordance with the Certificate holder's instructions and in compliance with the NFRC Safe2Torch guidance document.

Mechanically fixed applications

14.7 The membrane is unrolled onto the substrate, avoiding folds or ripples, with 95 mm overlaps and secured using tube washers and fasteners recommended and supplied only by the Certificate holder.

14.8 The membrane is fixed to the deck (through insulation boards, where appropriate) in the joint overlaps positioned 45 mm from the edge, prior to welding the joint. The fixings must be installed at centres calculated from the average wind force in that location.

14.9 Overlap joints must be sealed using flame free automatic hot air welding techniques or torched as described in section 14.2.

14.10 At perimeters, corner zones and all penetrations the membrane must be fully bonded using flame free hand held hot air welding techniques or torched as described in section 14.2 to the Stickflex PY peel stop.

14.11 Detailing should be completed in accordance with the Certificate holder's instructions and in compliance with the NFRC Safe2Torch guidance document.

15 Repair

Damage is repaired by cleaning the affected area, locally heating the ceramic granule or mineral slate finish to ensure a black to black bitumen bond is achieved and installing a patch of the appropriate capsheet by torch or hot air welding technique over the damaged area, all in accordance with the Certificate holder's instructions.

Technical Investigations

16 Tests

16.1 An assessment was made of test data to determine:

- tensile strength and elongation
- dimensional stability
- static indentation
- dynamic impact
- resistance to slippage
- resistance to fatigue
- low temperature flexibility
- heat resistance
- tensile joint strength
- resistance to air pressure
- peel resistance
- effects of heat ageing followed by resistance to fatigue, low temperature flexibility, heat resistance, tensile strength of joints and peel resistance
- effects of water soak followed by peel resistance
- effects of 180 day water soak at 60°C followed by shear resistance, peel resistance and resistance to leakage of joints

in order to assess:

- effect of substrate movement
- resistance to wind
- effect of temperature
- durability.

16.2 An assessment was made of fire test reports.

16.3 An assessment was made of wind uplift test data.

16.4 An assessment was made of independent test data relating to the mechanically fixed system.

17 Investigations

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

17.2 The installation instructions were evaluated in order to assess the practicability of installation.

17.3 A visit to a site in progress was carried out to investigate installation procedures.

Bibliography

BS 6229 : 2018 *Flat roofs with continuously supported flexible waterproof coverings — Code of practice*

BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*

BS 8747 : 2007 *Reinforced bitumen membranes (RBMs) for roofing — Guide to selection and specification*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions*

NA to BS EN 1991-1-4 : 2005 + A1 : 2010 *UK National Annex to Eurocode 1 — Actions on structures — General actions*

BS EN 13501-5 : 2016 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roofs tests*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

BS EN ISO 14001 : 2015 *Environmental management systems — Requirements*

CEN/TS 16459 : 2013 *External fire exposure of roofs and roof coverings — Extended application of test results from CEN/TS 1187*

EN 13707 : 2013 *Flexible sheets for waterproofing — Reinforced bitumen sheets for roof waterproofing — Definitions and characteristics*

DD CEN/TS 1187 : 2012 *Test methods for external fire exposure to roofs*

18 Conditions

18.1 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.

18.2 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.

18.3 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.

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

18.5 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
- actual 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
- any claims by the manufacturer relating to CE marking.

18.6 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.