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Agrément Certificate

94/3037

Product Sheet 1 Issue 5

AXTER BITUMEN ROOF WATERPROOFING SYSTEMS

AXTER EXCEL AND EXCEL SOLAR ROOF WATERPROOFING SYSTEMS

This Agrément Certificate Product Sheet⁽¹⁾ relates to Axter Excel and Excel Solar Roof Waterproofing Systems, comprising Alpa⁽²⁾ polymer-modified self-finished bitumen waterproofing membranes and styrene-butadiene-styrene (SBS) polymer-modified underlays, for use fully or partially bonded, in flame free hot air welded, mechanically fixed or torch-applied applications, on flat and pitched roofs, terraces, balconies and podia, including protected zero fall specifications, and specifications in combination with a Solar PV system⁽³⁾.

(1) Hereinafter referred to as 'Certificate'.

(2) Alpa is a registered trademark.

(3) The Solar PV system is outside the scope of this Certificate.

The assessment includes

Product factors:

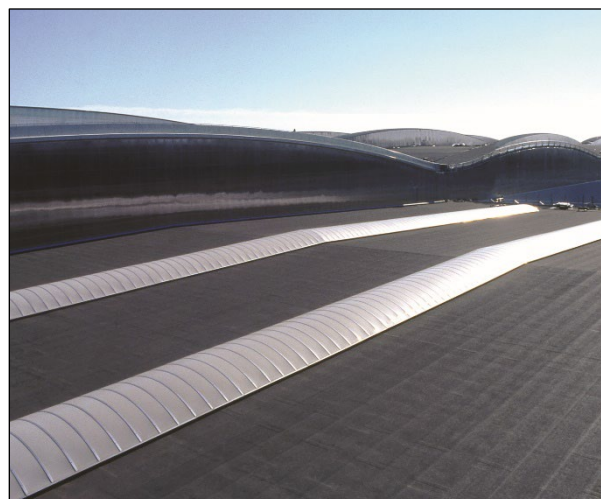
- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review



KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

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 Fifth issue: 21 August 2023

Originally certified on 5 July 1994

Hardy Giesler
Chief Executive Officer

Certificate amended on 15 November 2023 to update reaction to fire clauses 2.2.6 to 2.2.9.

This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.

The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).

Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

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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SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that Axter Excel and Excel Solar 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 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 2 of this Certificate.	
Requirement:	B4(2)	External fire spread
Comment:	On a suitable substructure, the systems may enable a roof to be unrestricted under this Requirement. See section 2 of this Certificate.	
Requirement:	C2(b)	Resistance to moisture
Comment:	The systems, including joints, will enable a roof to satisfy this Requirement. See section 3 of this Certificate.	
Regulation:	7(1)	Materials and workmanship
Comment:	The systems are acceptable. See sections 8 and 9 of this Certificate.	
Regulation:	7(2)	Materials and workmanship
Comment:	Use of the systems on balconies is restricted by this Regulation. See section 2 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 8 and 9 of this Certificate.	
Regulation:	9	Building standards - construction
Standard:	2.2	Separation
	Use of the systems on balconies is restricted under clause 2.2.7 ⁽¹⁾ of this Standard. See section 2 of this Certificate.	
Standard:	2.6	Spread to neighbouring buildings
Standard:	2.7	Spread on external walls
Comment:	The systems are restricted under clauses 2.6.4 ⁽¹⁾⁽²⁾ and 2.7.2 ⁽¹⁾⁽²⁾ of these Standards in some circumstances. See section 2 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 section 2 of this Certificate.	

Standard:	3.10	Precipitation
Comment:		The use of the systems, including joints, will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 and 3.10.7 ⁽¹⁾ . See section 3 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 - 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(1)(a)	Fitness of materials and workmanship
Comment:	(i)(iii)(b)(i)	The systems are acceptable. See sections 8 and 9 of this Certificate.
Regulation:	23(2)	Fitness of materials and workmanship
Comment:		Use of the systems on balconies is restricted under this Regulation. See section 2 of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The systems, including joints, can satisfy the requirements of this Regulation. See section 3 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The systems are restricted by this Regulation in some circumstances. See section 2 of this Certificate.
Regulation:	36(b)	External fire spread
Comment:		On a suitable substructure, the use of the systems may enable a roof to be unrestricted under the requirements of this Regulation. See section 2 of this Certificate.

Additional information

NHBC Standards 2023

In the opinion of the BBA, Axter Excel and Excel Solar 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*.

In addition, in the opinion of the BBA, the systems, when installed and used in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards for Conversions and Renovations*, taking account of other relevant guidance within the chapter and the suitability of the substrate to receive the systems.

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

Fulfilment of Requirements

The BBA has judged the Axter Excel and Excel Solar Roof Waterproofing Systems to be satisfactory for use as reinforced modified waterproofing membranes as described in this Certificate. The systems have been assessed for use fully or partially bonded, in flame free hot air welded, mechanically fixed or torch-applied applications, on flat roofs, terraces, balconies and podia and pitched roofs, including protected zero fall specifications.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the systems under assessment. Axter Excel and Excel Solar Roof Waterproofing Systems consist of:

- Axter Excel — an Alpa polymer-modified bitumen capsheet, with a polyester reinforcement (nominal $180 \text{ g}\cdot\text{m}^{-2}$), torch-applied or flame free hot air welded, finished with ceramic granule or mineral slate on the upper face and a thermofusible film on the lower face
- Axter Force Solo — an Alpa polymer-modified bitumen capsheet, with a polyester reinforcement (nominal $180 \text{ g}\cdot\text{m}^{-2}$), torch-applied or flame free hot air welded, finished with ceramic granule or mineral slate on the upper face and a thermofusible film on the lower face
- Axter Excel FM — an Alpa polymer-modified bitumen capsheet, with a polyester reinforcement (nominal $180 \text{ g}\cdot\text{m}^{-2}$), mechanically fixed, finished with ceramic granule or mineral slate on the upper face and a thermofusible film on the lower face
- Axter Excel Plus — an Alpa polymer-modified bitumen capsheet, with a polyester reinforcement (nominal $180 \text{ g}\cdot\text{m}^{-2}$), torch-applied or flame free hot air welded, finished with ceramic granule or mineral slate on the upper face and a thermofusible film on the lower face
- Axter TS CPV — a torch-applied SBS modified bitumen underlay, with a polyester reinforcement (nominal $120 \text{ g}\cdot\text{m}^{-2}$), with a macroperforated and sand finish on the upper face and a thermofusible film on the lower face
- Axter SPOT ADH — a heat activated self-adhesive SBS modified bitumen underlay, with a polyester reinforcement (nominal $120 \text{ g}\cdot\text{m}^{-2}$), with a macroperforated film and sand finish upper face, and a silicone release film on the lower face
- Axter TS PY — a torch-on SBS modified bitumen intermediate layer, with a polyester reinforcement (nominal $180 \text{ g}\cdot\text{m}^{-2}$), with sand finished upper face and a thermofusible film on the lower face
- Axter Excel Solar — an Alpa polymer-modified bitumen top layer with a polyester reinforcement (nominal $180 \text{ g}\cdot\text{m}^{-2}$), mechanically fixed, torch-applied or flame free hot air welded. Finished with a peel-off silicone film on the upper face designed for the attachment of flexible solar cells, and with a thermofusible film on the lower face.

The membranes have the nominal characteristics given in Table 1.

Table 1 Nominal characteristics of the membranes

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
Roll weight (kg)	40.6	47.1	47.1	24.7	31.6	22.7	42.1

(1) On the selvedge.

(2) On the finished product.

Ancillary Items

The Certificate holder recommends the following ancillary items for use with the systems, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- Proofcoat Emulsion — a 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 — a solvent-based bitumen primer for use in preparing substrates prior to installation of torch-applied bitumen membranes and air and vapour control layers (AVCL)
- Vernis SA — a synthetic rubber-based primer for use in preparing substrates prior to installation of Axter NEO-Bitumen⁽¹⁾ flame free self-adhesive membranes and AVCL's
- Vernis Seal — a synthetic resin-based pigmented primer for use in preparing substrates prior to installation of bitumen membranes and AVCL's
- Bitumseal — a cold-applied polymer-modified bitumen adhesive and sealant
- Mastic Hyrene — a cold bitumen bonding compound
- Hyrastick EVO — a cold-applied polyurethane adhesive
- ADH Adhesive — a cold-applied adhesive for bonding bitumen and synthetic membranes
- Hytherm insulation products — a range of thermal insulation products
- Axter Water Flow Reducing Layer (WFRL) — a spun bonded polyethylene geotextile installed above inverted roof insulation to minimise heat loss caused by rainwater cooling
- 35 PY Angle Reinforcement — a polyester reinforced elastomeric SBS membrane for details reinforcement
- Stickflex PY Angle Reinforcement — Axter NEO-Bitumen⁽¹⁾ 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 180 g·m⁻² stabilised polyester
- Starcoat R — a cold liquid applied single component bitumen resin for waterproofing complex details
- Axter MTP/C carbon steel/stainless steel self-drilling fasteners and insulated tube washers — for use in mechanically fixed Excel FM and Excel Solar specifications
- Axter Excel 25 Solar — an Alpa polymer modified bitumen, torch-applied or flame free hot air welded top layer. Flexible thin-film photovoltaic (PV) modules for bonding to Axter Excel 25 Solar and Excel Solar capsheets, reinforced with 50 g·m⁻² glass fibre
- Stickflex — an Axter NEO-Bitumen flame free reinforced elastomeric SBS underlayer membrane with a sand finish surface, and a silicone release film on the under surface
- Stickflex Sanded — an Axter NEO-Bitumen flame free reinforced elastomeric SBS underlayer membrane with a sand finish surface, and a silicone release film on the under surface
- VAP ALU ADH — an Axter Air and Vapour Control Layer (AVCL)
- Axter bitumen membrane AVCL's — a range of AVCL products.

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

Applications

Axter Excel and Excel Solar 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.

Definitions for products and applications inspected

The following terms are defined for the purpose of this Certificate as:

- limited access roofs — a roof 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
- flat roofs — a roof having a minimum finished fall of 1:80
- pitched roofs — a roof having a fall greater than 1:6
- zero fall roofs — a roof having a finished fall which can vary between 0 and 1:80.

Product assessment – key factors

The systems were assessed for the following key factors, and the outcome of the assessments is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

1 Mechanical resistance and stability

Not applicable.

2 Safety in case of fire

Data were assessed for the following characteristics.

2.1 External fire spread

2.1.1 When tested to DD CEN/TS 1187 : 2012, Test 4⁽¹⁾ and classified to EN 13501-5 : 2016⁽²⁾ the systems given in Table 2 of this Certificate achieved B_{ROOF}(t4) for slopes below 10°.

(1) Warringtonfire 20295A+B+G, copies are available from the Certificate holder.

(2) Warringtonfire 20295C+D+J, copies are available from the Certificate holder.

Table 2 Tested systems

Layer	System 1	System 2
Substrate	18 mm OSB board	18 mm OSB board
AVCL	2.2 mm self-adhesive Vap Alu ADH AVCL	2.2 mm self-adhesive Vap Alu ADH AVCL
Insulation	Hytherm (PIR) insulation board (50 mm or greater thickness) adhered with Hyrastik Evo adhesive	Hytherm (PIR) insulation board (50 mm or greater thickness) adhered with Hyrastik Evo adhesive
Underlayer	2.6 mm self-adhesive Hyranger Spot ADH	2.6 mm self-adhesive Hyranger Spot ADH
Capsheet	4.0 mm Excel/Excel FM/Force Solo, mechanically/hot air/torch fixed	4.0 mm Excel/Excel FM/Excel Solar/Force Solo, mechanically/hot air/torch fixed
Protection	—	2.5 mm self-adhesive Solar PV Flex modules ⁽¹⁾

(1) Solar PV Flex modules are outside the scope of this Certificate.

2.1.2 On the basis of data assessed, the systems listed in Table 2 will be unrestricted by the documents supporting the national Building Regulations with respect to proximity to a boundary. Restrictions may apply at junctions with compartment walls.

2.1.3 In Wales and Northern Ireland, when used on flat roofs using a substrate designated in the supporting documents with the surface finishes listed below, the roof is also deemed to be unrestricted with respect to a boundary:

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

2.1.4 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.

2.2 Reaction to fire

2.2.1 The Certificate holder has not declared a reaction to fire classification for the system to BS EN 13501-1 : 2018.

2.2.2 On the basis of data assessed, the systems will be restricted in use under the documents supporting the national Building Regulations in some cases.

2.2.3 In England, the systems, when used in pitches greater than 70°, excluding upstands, must not be used less than 1 m from a boundary, or on residential buildings more than 11 m in height, or on other buildings more than 18 m in height. Restrictions apply on assembly and recreation buildings. These constructions must also be included in calculations of unprotected area.

2.2.4 In Wales, the systems, when used in pitches greater than 70°, excluding upstands, must not be used less than 1 m from a boundary, or on other buildings more than 18 m in height. Restrictions apply on assembly and recreation buildings. These constructions must also be included in calculations of unprotected area.

2.2.5 In Scotland and Northern Ireland, for systems used on walls or on roofs with pitches greater than 70°, excluding upstands, that do not achieve the minimum Class E reaction to fire classification to BS EN 13501-1 : 2018, designers must seek guidance on the proposed use of the system from the relevant Building Control Body.

2.2.6 In England, unless covered with a protection with a reaction to fire of class A1 or A2-s1, d0, for example 40 mm thick cast stone slabs, the system must not be used on balconies of residential buildings with a storey 11 m or more in height or balconies of buildings that have a storey at least 18 m above ground level and contain one or more dwellings, an institution, a room for residential purposes, student accommodation, care homes, sheltered housing, hospitals, dormitories in boarding schools, hotels, hostels or boarding houses.

2.2.7 In Wales, unless covered with a protection with a reaction to fire of class A1 or A2-s1, d0, for example 40 mm thick cast stone slabs, the system must not be used on balconies of buildings that have a storey at least 18 m above ground level and contain one or more dwellings, an institution, a room for residential purposes, student accommodation, care homes, sheltered housing, hospitals, dormitories or boarding schools.

2.2.8 In Northern Ireland, unless covered with a protection with a reaction to fire of class A1 or A2-s1, d0, for example 40 mm thick cast stone slabs, the system must not be used on balconies of buildings that have a storey at least 18 m above ground level and 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, dormitories in boarding schools, nursing homes and places of lawful detention.

2.2.9 In Scotland, the system must not be used on balconies of buildings with a storey at a height of 11 m or more above the ground.

3 Hygiene, health and the environment

Data were assessed for the following characteristics.

3.1 Weathertightness

3.1.1 Results of weathertightness tests are given in Table 3.

Table 3 Weathertightness tests

Product assessed	Assessment method	Requirement	Result
Axter Excel	Peel resistance to MOAT 27 : 1983 on rock wool insulation control	Greater than or equal to $25 \text{ N} \cdot (50 \text{ mm})^{-1}$	Pass
Axter Excel	Peel resistance of joints to BS EN 12316-1 : 2000 Control	Greater than or equal to $40 \text{ N} \cdot (50 \text{ mm})^{-1}$	Pass
Axter Excel	Shear resistance of joints to BS EN 12317-1 : 2000 Control	Greater than or equal to $500 \text{ N} \cdot (50 \text{ mm})^{-1}$	Pass
Axter Excel	Resistance to air leakage of joints to MOAT 27 : 1983 Control	No leak at 10 kPa	Pass
Axter Excel FM	Resistance to dynamical wind loads to EN 16002 : 2010	Value achieved	$\Delta W_{\text{char}} = 1000 \text{ N}$ $W_{\text{adm}} = 666 \text{ N}$

3.1.2 On the basis of data assessed, when mechanically fastened, Axter Excel FM and Axter Excel Solar will sufficiently resist the effects of wind suction likely to be experienced in the UK (see sections 9.1.6 and 9.1.7).

3.1.3 On the basis of data assessed, Axter Excel and Excel Solar Roof Waterproofing Systems, including joints, when completely sealed and consolidated, will adequately resist the passage of moisture to the inside of a building and so satisfy the requirements of the national Building Regulations.

3.1.4 On the basis of data assessed, the adhesion of the bonded systems is sufficient to resist the effects of wind suction, elevated temperature and thermal shock conditions likely to occur in practice and remain weathertight.

3.2 Resistance to mechanical damage

3.2.1 Results of resistance to mechanical damage tests are given in Table 4.

Table 4 Mechanical damage results

Product assessed	Assessment method	Requirement	Result
Axter Excel	Tensile strength to MOAT 31 : 1984 Longitudinal direction	Certificate holder's Declared value $\pm 20\%$	Pass
	Transverse direction		Pass
Axter Excel	Elongation to break to MOAT 31 : 1984 Longitudinal direction	Certificate holder's Declared value $\pm 15\%$	Pass
	Transverse direction		Pass
Axter Excel	Static indentation to NFP 84-352 Perlite substrate	Value achieved	28 ⁽¹⁾
	EPS substrate		25 ⁽¹⁾
Axter Excel	Dynamic indentation to MOAT 27: 1983 EPS substrate	Value achieved	I ₄
Axter Excel	Fatigue cycling to MOAT 31 : 1984	No cracks	Pass

(1) Result equivalent to MOAT 27 5.1.10 rating of L4.

3.2.2 On the basis of data assessed, Axter Excel and Excel Solar Roof Waterproofing Systems can accept, without damage, the foot traffic and light concentrated loads associated with installation and maintenance and the effects of minor movement likely to occur in practice while remaining weathertight.

3.2.3 Where traffic in excess of the examples given in section 3.2.2 is envisaged, such as for maintenance of lift equipment, a walkway must be provided. Reasonable care must be taken to avoid puncture by sharp objects or concentrated loads.

4 Safety and accessibility in use

Not applicable.

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

Not applicable.

7 Sustainable use of natural resources

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

8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in the systems were assessed.

8.2 Specific durability test data were assessed as given in Table 5.

Table 5 Results of durability tests

Products assessed	Assessment method	Requirement	Result
Axter Excel	Dimensional stability to MOAT 27 : 1983	Certificate holder's Declared value $\leq 0.3\%$	
	Longitudinal direction		Pass
	Transverse direction		Pass
Axter Excel	Resistance to slippage to MOAT 27 : 1983	Maximum movement of 2 mm	Pass
Axter Excel	Fatigue cycling to MOAT 31 : 1984	No cracks	
	Heat aged for 28 days at 80°C		Pass
	200 cycles at -20°C		
Axter Excel	Tensile joint strength to MOAT 27 : 1983	≥ 500 N	
	Control		Pass
	Heat aged for 28 days at 80°C		Pass
Axter Excel	Peel from substrate (rock wool insulation) to MOAT 27 : 1983	$\geq 50\%$ of the initial value and $\geq 25 \text{ N} \cdot (50 \text{ mm})^{-1}$	
	Control Heat aged for 28 days at 80°C		Pass
	Water soak for 7 days at 60°C		Change $\leq 20\%$ Pass
Axter Excel	Low temperature flexibility to BS EN 1109 : 2013	No visible cracking at 0°C	
	Control		Pass
	Heat aged for 240 days at 70°C		Pass
Axter Excel	Heat resistance to BS EN 1110 : 2010 test at 110°C	Maximum movement of 2 mm	
	Control		Pass
	Heat aged for 240 days at 70°C		Pass
Axter Excel	Peel resistance of joints to BS EN 12316-1 : 2000	$\geq 40 \text{ N} \cdot (50 \text{ mm})^{-1}$	
	Control		Pass
	Water ageing 216 days at 60°C		Pass
Axter Excel	Shear resistance of joints to BS EN 12317-1 : 2000	$\geq 500 \text{ N} \cdot (50 \text{ mm})^{-1}$	
	Control		Pass
	Water ageing for 216 days at 60°C		Pass
Axter Excel	Resistance to air leakage of joints to MOAT 27 : 1983	No leak at 10 kPa	Pass

8.3 Test data were examined for the coating mass of Axter Excel, on samples aged for six months at 70°C for ring and ball, low temperature flexibility and elasticity recovery tests.

8.4 Service life

8.4.1 Under normal service conditions, the systems will have a life of at least 30 years, provided they are designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

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

PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

9 Design, installation, workmanship and maintenance

9.1 Design

9.1.1 The design process was assessed, and the following requirements apply in order to satisfy the performance assessed in this Certificate.

9.1.2 Decks to which the systems are to be applied must comply with the relevant requirements of BS 6229 : 2018, BS 8217 : 2005 and, where appropriate, *NHBC Standards* 2023, Chapter 7.1.

9.1.3 For design purposes of flat roofs, twice the minimum finished fall must be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls.

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

- provision made for access for maintenance purposes
- the correct drainage points must be identified, to ensure that drainage is sufficient and effective in accordance with the relevant clauses of BS 6229 : 2018.

9.1.5 Balconies and terraces, to which the systems are to be applied, must be designed in accordance with BS 8579 : 2020.

9.1.6 If the roof is likely to be subjected to uncontrolled pedestrian access, the substructure must satisfy the requirements of the relevant clauses of BS 8217 : 2005, and one of the surface finishes described in clause 6.12 of the Code of Practice must be used.

9.1.7 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 for the systems must be established using a maximum permissible load of 0.666 kN per fixing for the systems fixed using Axter MTP/C fasteners and insulated tube washers.

9.1.8 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 resisted
- pull-out strength of fasteners
- tensile properties of membranes
- appropriate calculation of safety factors.

9.1.9 Insulation materials to be 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 6229 : 2018, or
- the subject of a current BBA Certificate and be used in accordance with, and within the limitations of, that Certificate.

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 Installation must be carried out in accordance with this Certificate, the Certificate holder's instructions and the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989 and BS 8217 : 2005. A summary of instructions and guidance are provided in Annex A of this Certificate.

9.2.3 Deck surfaces must be sound, dry and clean, and free from sharp projections such as nail heads and concrete nibs.

9.2.4 The systems are laid in conditions normal to roofing work and must not be laid in rain, snow or heavy fog, or if the temperature falls below 5°C, if adhered, suitable precautions must be taken against the formation of condensation on the substrate.

9.2.5 At falls in excess of 5° (1:11), precautions against slippage, and requirements for mechanical fixings as required by BS 8217 : 2005, must be observed. For slopes above 1:6 (10°), the Certificate holder's technical department must be consulted to ensure correct precautions are undertaken, but such advice is outside of the scope of this Certificate.

9.2.6 The NHBC requires that the systems, once installed, are inspected in accordance with *NHBC Standards 2023*, Chapter 7.1, Clause 7.1.11, and undergo an appropriate integrity test, where required. Any damage to the systems assessed in this Certificate must be repaired in accordance with section 9.4 of this Certificate and reinspected, in order to maintain the systems performance.

Procedure

Fully bonded single and multi-layer applications

9.2.7 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.

9.2.8 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.

9.2.9 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.

Partially bonded applications

9.2.10 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.

Mechanically fixed applications

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

9.2.12 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.

9.2.13 Overlap joints must be sealed using flame free automatic hot air welding techniques or torched as described in sections 9.2.7 and 9.2.8.

9.2.14 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 sections 9.2.7 and 9.2.8 to Stickflex PY peel stop.

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

9.3 Workmanship

Practicability of installation was assessed by the BBA, on the basis of the Certificate holder's information and a site visit to witness an installation in progress. To achieve the performance described in this Certificate, installation of the systems must be carried out by installers who have been trained and approved by the Certificate holder.

9.4 Maintenance and repair

9.4.1 Ongoing satisfactory performance of the systems in use requires that they are suitably maintained. The guidance provided by the Certificate holder was assessed by the BBA and found to be appropriate and adequate.

9.4.2 The following requirements apply in order to satisfy the performance assessed in this Certificate:

9.4.2.1 The systems be the subject of six-monthly inspections and maintenance in accordance with the recommendations of BS 6229 : 2018, Chapter 7, and the Certificate holder's own maintenance requirements, where relevant, to ensure continued satisfactory performance.

9.4.2.2 In the event of the systems being contaminated by oil, grease or other chemicals, the advice of the Certificate holder must be sought, but such advice is outside of the scope of this Certificate.

9.4.2.3 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.

10 **Manufacture**

10.1 The production processes for the systems have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

† 10.2 The BBA has undertaken to review 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.

11 Delivery and site handling

11.1 The Certificate holder stated that the systems components are delivered to site in on pallets wrapped in polythene and bearing the systems name and production code, with tape bands.

11.2 Delivery and site handing must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.2.1 Rolls must be stored upright on a clean, level surface and kept dry, away from excessive heat and under cover.

ANNEX A – SUPPLEMENTARY INFORMATION †

Supporting information in this Annex is relevant to the systems but has not formed part of the material assessed for the 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.

CLP Regulations

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

CE marking

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

Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of ISO 9001 : 2015 and ISO 14001 : 2015 by AFAQ (Certificates 1996/5190.12 and 2011/40665.4 respectively).

Additional information on installation

Installation

A.1 On completion of the roof, additional surface protection is not required where the systems are self-protected and have either a ceramic granule or mineral slate finish and 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.

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 8579 : 2020 *Guide to the design of balconies and terraces*
- BS EN 1109 : 2013 *Flexible sheets for waterproofing. Bitumen sheets for roof waterproofing. Determination of flexibility at low temperature*
- BS EN 1110 : 2010 *Flexible sheets for waterproofing — Bitumen sheets for roof waterproofing — Determination of flow resistance at elevated temperature*
- BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*
- NA to BS EN 1991-1-4 : 2005 + A1 : 2010 *UK National Annex to Eurocode 1 : Actions on structures — General actions — Wind actions*
- BS EN 12316-1 : 2000 *Flexible sheets for waterproofing — Determination of peel resistance of joints — Bitumen sheets for roof waterproofing*
- BS EN 12317-1 : 2000 *Flexible sheets for waterproofing — Bitumen sheets for roof waterproofing — Determination of shear resistance of joints*
- BS EN 13501-1 : 2018 *Fire classification of construction products and building elements. Classification using data from reaction to fire tests*
- DD CEN/TS 1187 : 2012 *Test methods for external fire exposure to roofs*
- EN 13501-5 : 2016 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roofs tests*
- EN 13707 : 2013 *Flexible sheets for waterproofing — Reinforced bitumen sheets for roof waterproofing — Definitions and characteristics*
- EN 16002 : 2010 *Flexible sheets for waterproofing — Determination of the resistance to wind load of mechanically fastened flexible sheets for roof waterproofing*
- ISO 9001 : 2015 *Quality management systems — Requirements*
- ISO 14001 : 2015 *Environmental management systems — Requirements with guidance for use*
- MOAT 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*
- MOAT 31 : 1984 *Special Directives for the assessment of Reinforced Homogeneous Waterproofing Coverings of Styrene-Butadiene-Styrene (SBS) Elastomer Bitumen*
- NFP 84-352, Dic 88 *Waterproofing — Sheetings for roofing and damp proofing — Determination of the resistance to static indentation*
- NFRC Safe2Torch guidance document *for the safe installation of torch-on reinforced bitumen membranes and use of gas torches in the workplace*

Conditions of Certificate

Conditions

1 This Certificate:

- relates only to the product 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.

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.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product 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.

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

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 or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA marking and CE marking.

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product 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.

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