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Agrément Certificate
10/4744
Product Sheet 1

BAUDER BITUMINOUS ROOFING SYSTEMS

BAUDER TOTAL ROOF WATERPROOFING SYSTEMS

This Agrément Certificate Product Sheet(1) relates to Bauder Total Roof Waterproofing Systems, elastomer modified bitumen waterproofing membranes and air and vapour control layers (avcls) for use fully bonded on pitched, flat and protected zero fall roofs, and blue roof specifications, in combination with a storm water attenuation system(2).

(1) Hereinafter referred to as 'Certificate'.
(2) The storm water attenuation system is outside the scope of this Certificate.

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 6).

Condensation risk — roofs incorporating the systems will adequately limit the risk of interstitial and surface condensation (see section 7).

Properties in relation to fire — the systems, when used in a suitable specification, can enable a roof to be unrestricted under the national Building Regulations (see section 8).

Resistance to wind uplift — the systems will resist the effects of any likely wind suction acting on the roof (see section 9).

Resistance to mechanical damage — the systems will accept, without damage, the limited foot traffic and loads associated with installation and maintenance (see section 10).

Durability — under normal service conditions, the systems will provide a durable waterproof covering with a service life in excess of 35 years (see section 12).

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 Agrement

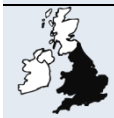
Hardy Giesler
Chief Executive Officer

Date of Seventh issue: 3 April 2020

Originally certificated on 26 March 2010
Certificate amended on 23 September 2020 to update zero fall wording.
Certificate amended on 19 November 2020 to update section 11.

Regulations

In the opinion of the BBA, Bauder Total 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(2)**	**External fire spread**
Comment:		On a suitable substructure, the systems can enable a roof to be unrestricted under this Requirement. See sections 8.1 to 8.3, 8.4 (applicable to Wales only) and 8.5 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The membranes, including joints, will enable a roof to satisfy this Requirement. See section 6.1 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The systems can contribute to enabling a roof to satisfy this Requirement. See section 7 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The systems are acceptable. See section 12.1 and the *Installation* 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 satisfies the requirements of this Regulation. See sections 11.1 and 12.1 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	2.8	Spread from neighbouring buildings
Comment:		The systems, when applied to a suitable substructure, can be regarded as having low vulnerability under clause 2.8.1[(1)(2)] of this Standard. See sections 8.1 to 8.3 and 8.5 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The use of the membranes, including joints, will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1[(1)] and 3.10.7[(1)]. See section 6.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The systems will enable a roof to satisfy this Standard, with reference to clauses 3.15.1[(1)], 3.15.3[(1)], 3.15.5[(1)] and 3.15.6[(1)]. See section 7 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The systems can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	**12**	**Building standards 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 12.1 and the *Installation* 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 6.1 of this Certificate.
Regulation:	**29**	**Condensation**
Comment:		The systems can contribute to a roof satisfying this Regulation. See section 7 of this Certificate.
Regulation:	**36(b)**	**External fire spread**
Comment:		On a suitable substructure, the use of the systems can enable a roof to be unrestricted under the requirements of this Regulation. See section 8 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 2020

In the opinion of the BBA, Bauder Total 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 and balconies*.

CE marking

The Certificate holder has taken the responsibility of CE marking the waterproofing membranes and avcls in accordance with harmonised European Standards EN 13707 : 2013 and EN 13970 : 2004 respectively.

Technical Specification

1 Description

1.1 Bauder Total Roof Waterproofing Systems comprise the following waterproofing membranes and avcls:

- Bauder KARAT — a polymer modified bitumen capsheet with a mineral finish, incorporating fire retardant, a glass/polyester composite reinforcement (300 g·m^{-2}), with an APP modified coating mass for upper face of membrane and an elastomer modified coating mass for the lower face of the membrane, for use in BTRS PLUS systems
- Bauder K5K — an elastomer modified bitumen, torch-on mineral finish capsheet incorporating fire retardant, and reinforced with 250 g·m^{-2} spunbond polyester fleece
- Bauder K5E — an elastomer modified bitumen, torch-on mica finish capsheet reinforced with 250 g·m^{-2} spunbond polyester fleece, for use in protected specifications
- BauderTEC KSO SN — an elastomer modified bitumen, heat activated self-adhesive, mineral finish detailing capsheet, reinforced with 200 g·m^{-2} glass fibre
- BauderTEC KSO-P SN — an elastomer modified bitumen, heat activated self-adhesive, mineral finish detailing capsheet, reinforced with 215 g·m^{-2} polyester fleece

- Bauder G4E — an elastomer modified bitumen, torch-on underlay reinforced with 200 g·m^{-2} woven glass
- BauderTEC KSA DUO — an elastomer modified bitumen, heat-activated, self-adhesive underlay reinforced with 120 g·m^{-2} glass fibre
- BauderTEC KSA DUO 35 — an elastomer modified bitumen, heat-activated, self-adhesive underlay reinforced with 200 g.m^{-2} glass fibre. For use in BTRS PLUS systems
- BauderTHERM DS1 DUO — an elastomer modified bitumen, heat-activated, self-adhesive avcl reinforced with 60 g·m^{-2} glass fibre and polyester coated aluminium
- Bauder VB4 Expal — an elastomer modified bitumen, torch-on avcl reinforced with 60 g·m^{-2} glass fleece and aluminium/polyester foil
- BauderTEC KSD Mica — an elastomer modified bitumen, cold self-adhesive avcl reinforced with aluminium foil and 200 g·m^{-2} glass fleece

1.2 The nominal characteristics of the capsheets, underlay membranes and avcls are shown in Tables 1, 2 and 3 respectively.

Table 1 Nominal characteristics – modified bitumen capsheets

Characteristic (unit)	Capsheet				
	Bauder KARAT	Bauder K5K	Bauder K5E	BauderTEC KSO-SN	BauderTEC KSO-P SN
Thickness (mm)	5.2	5.2	5.0	4.0	4.0
Roll width (m)	1.0	1.0	1.0	1.0	1.0
Roll length (m)	5.0	5.0	5.0	5.0	5.0
Mass per unit area (kg·m^{-2})	6.0	6.0	5.8	4.6	4.6
Tensile strength (N per 50 mm)					
longitudinal	≥ 1450	≥ 1000	≥ 800	≥ 1000	≥ 1000
transverse	≥ 1450	≥ 1000	≥ 800	≥ 1000	≥ 900
Elongation (%)					
longitudinal	≥ 23	≥ 45	≥ 40	≥ 2	≥ 40
transverse	≥ 23	≥ 45	≥ 40	≥ 2	≥ 40
Watertightness	pass	pass	pass	pass	pass
Low temperature flexibility (°C)	upper face ≤ –25 lower face ≤ –40	≤ –36	≤ –30	≤ –30	≤ –30
Flow resistance (°C)	upper face ≥ 150 lower face ≥ 120	≥ 120	≥ 110	≥ 100	≥ 100
Upper surface finish	mineral chippings	mineral chippings	mica	natural slate	mineral chippings
Lower surface finish	thermofusible polyethylene	thermofusible polyethylene	thermofusible polyethylene	peel-off film covering self-adhesive bitumen	peel-off film covering self-adhesive bitumen

Table 2 Nominal characteristics – modified bitumen underlays

Characteristic (unit)	Underlay		
	Bauder G4E	BauderTEC KSA DUO	BauderTEC KSA DUO 35
Thickness (mm)	4.0	3.0	3.5
Roll width (m)	1.0	1.0	1.0
Roll length (m)	7.5	7.5	7.5
Mass per unit area (kg·m^{-2})	4.8	3.5	4.0
Tensile strength (N per 50 mm)			
longitudinal	≥ 1200	≥ 1000	≥ 1000
transverse	≥ 1200	≥ 1000	≥ 1000
Elongation (%)			
longitudinal	≥ 2	≥ 2	≥ 2
transverse	≥ 2	≥ 2	≥ 2
Watertightness	pass	pass	pass
Low temperature flexibility (°C)	≤ -30	≤ -30	≤ -30
Flow resistance (°C)	≥ 110	≥ 100	≥ 100
Upper surface finish	mica	foil	foil
Lower surface finish	thermofusible polyethylene	peel-off film covering self-adhesive bitumen	peel-off film covering self-adhesive bitumen

Table 3 Nominal characteristics – avcls

Characteristic (unit)	avcl		
	BauderTHERM DS1 DUO	Bauder VB4 Expal	BauderTEC KSD mica
Thickness (mm)	4.0	3.5	2.5
Roll width (m)	1.08	1.00	1.08
Roll length (m)	7.5	7.5	10.0
Mass per unit area (kg·m^{-2})	4.5	4.5	2.5
Tensile strength (N per 50 mm)			
longitudinal	≥ 400	≥ 400	≥ 1000
transverse	≥ 300	≥ 400	≥ 1000
Elongation (%)			
longitudinal	≥ 2	≥ 2	≥ 2
transverse	≥ 2	≥ 2	≥ 2
Watertightness	pass	pass	pass
Low temperature flexibility (°C)	≤ -25	≤ -20	≤ -25
Water vapour diffusion-equivalent air layer thickness (m)	≥ 1500	≥ 1500	≥ 1500
Upper surface finish	mica and heat-activated adhesive strip	mica	mica and 80 mm width thermofusible strip
Lower surface finish	perforated peel-off film covering heat-activated self-adhesive bitumen	thermofusible polyethylene	peel-off film covering self-adhesive bitumen and 80 mm width glass fleece strip

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

- bitumen grade 95/25 — for use in bonding insulation
- Bauder SA Bonding Primer — for use in preparing substrates prior to installation of self-adhesive membranes
- Bauder Quick Dry Bitumen Primer — for use in preparing substrates prior to installation of torch-applied membranes
- Bauder Activator-Primer — for use in preparing substrates prior to installation of torch-applied or self-adhesive membranes
- Bauder PU Insulation Adhesive (Tin or Cartridge) — for use in bonding insulation
- Bauder Foil Contact Adhesive — for use in bonding aluminium foil surfaced insulation together

- BauderPIR Flatboard — a polyisocyanurate insulation board, manufactured to BS EN 13165 : 2012, for use on flat roofs
- BauderPIR Tapered — a polyisocyanurate insulation board, manufactured to BS EN 13165 : 2012, for use on flat roofs
- BauderPIR FA Tapered — a polyisocyanurate insulation board, manufactured to BS EN 13165 : 2012, for partially bonding on flat roofs (only for use in conjunction with Bauder self-adhesive underlayers)
- BauderPIR Valley and Ridge infills — for use in conjunction with BauderPIR FA Tapered insulation
- BauderPIR FA-TE — a polyisocyanurate insulation board, manufactured to BS EN 13165 : 2012, for partially bonding on flat roofs (only for use in conjunction with Bauder self-adhesive underlayers)
- BauderVIP — a vacuum insulation/PIR composite panel for use on flat roofs
- BauderROCK — a mineral fibre insulation board, manufactured to BS EN 13162 : 2012 for use on flat roofs
- BauderGLAS - a cellular glass insulation, manufactured to BS EN 13167: 2013-03, for use on flat roofs
- BauderJFRI — an expanded polystyrene insulation board manufactured to BS EN 13163 : 2012 for use in inverted roof specifications
- storm water attenuation systems — for use in conjunction with blue roof specifications, the advice of the Certificate holder on appropriate systems should be sort.

2 Manufacture

2.1 The waterproofing membranes and avcls are manufactured by saturating and coating the reinforcement with polymer modified bitumen, then calendering to the 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 Paul Bauder GmbH has been assessed and registered as meeting the requirements of EN ISO 9001 : 2015 (Certificate 70499/03-18c).

3 Delivery and site handling

3.1 The membranes are delivered to site in rolls with either paper wrappers or tape bands bearing the product name and production code. The rolls are packed on pallets and shrink-wrapped in polythene.

3.2 Rolls should be stored upright on a clean, level surface, away from excessive heat and kept under cover. The self-adhesive products should be stored 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 Bauder Total Roof Waterproofing Systems.

Design Considerations

4 General

4.1 Bauder Total Roof Waterproofing Systems are satisfactory for use as fully bonded roof waterproofing systems including avcls on pitched, flat or protected zero fall roofs with limited access(1). The systems can be used in blue roof specifications in combination with a storm water attenuation system(2).

(1) The Certificate holder can advise on specific installation specification for particular projects.
(2) The storm water attenuation system is outside the scope of this Certificate.

4.2 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* 2020, 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 must be provided (see section 10 of this Certificate and the relevant clauses of the Certificate holder's installation instructions).

4.4 Flat roofs are defined for the purpose of this Certificate as those 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.

4.5 Pitched roofs are defined for the purpose of this Certificate as those having a fall in excess of 1:6.

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

4.7 Blue roofs are defined for the purpose of this Certificate as flat roofs designed to allow controlled attenuation of rain fall during heavy and storm events, as part of sustainable urban drainage systems (SUDS).

4.8 On protected zero fall roofs it is particularly important to identify the correct drainage points to ensure that the drainage provided is effective.

4.9 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 8217 : 2005, or
- the subject of a current BBA Certificate and be used in accordance with, and within the limitations of, that Certificate.

5 Practicability of installation

The systems must be installed by contractors who have been trained and approved by the Certificate holder.

6 Weathertightness

6.1 The waterproofing membranes, including joints, when completely sealed and consolidated, will adequately resist the passage of moisture to the interior of a building and so satisfy the requirements of the national Building Regulations.

6.2 The membranes are impervious to water and when used in the systems described will give a weathertight roofing capable of accepting minor structural movement without damage.

7 Condensation risk

The avcls provide effective control to the passage of liquid water and water vapour.

8 Properties in relation to fire

8.1 When classified in accordance with BS EN 13501-5 : 2016 the following systems achieved a B_{ROOF}(t4) classification:

- 18 mm OSB, BauderTEC KSD Mica, Bauder PU Insulation Adhesive, BauderPIR FA TE (60 to 240 mm), BauderTEC KSA DUO and Bauder K5K(1)
- 18 mm OSB, BauderTEC KSD Mica, Bauder PU Insulation Adhesive, BauderROCK (30 to 225 mm), Bauder G4E and Bauder K5K(2)
- 18 mm OSB, BauderTEC KSD Mica, Bauder PU Insulation Adhesive, 80 mm thickness of BauderVIP, BauderTEC KSA DUO and Bauder K5K(3).

(1) Fire Classification report, reference 18675C, conducted by Warrington Fire, Gent. Report available from the Certificate holder.
(2) Fire Classification report, reference 19441J, conducted by Warrington Fire, Gent. Report available from the Certificate holder.
(3) Fire Classification report, reference 19775B, conducted by Warrington Fire, Gent. Report available from the Certificate holder.

8.2 When tested to DD CEN/TS 1187 : 2012 and classified in accordance with BS EN 13501-5 : 2016, a system comprising 18 mm OSB, BauderTEC KSD Mica, Bauder PU Insulation Adhesive, 120 mm thickness of BauderPIR FA TE, BauderTEC KSA DUO and Bauder KARAT(1), achieved a B_{ROOF}(t4) rating.

(1) Fire test report and Fire Classification report, references 18599A and 18599C respectively, conducted by Warrington Fire, Gent. Report available from the Certificate holder.

8.3 When protected by an inorganic covering (eg gravel or paving slabs) listed in the Annex of Commission Decision 2000/553/EC, the systems are considered to achieve a B_{ROOF}(t4) classification and so are unrestricted by the national Building Regulations.

8.4 When used on flat roofs with the surface finishes listed below, defined in the Building Regulations (Wales), Appendix A, Table A5, Part iii, or the Building Regulations (Northern Ireland), Technical Booklet E, Table 4.6, Part IV, 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 a non-combustible material
- sand and cement screed
- macadam.

8.5 The designation of other specifications should be confirmed by reference to the requirements of the documents supporting the national Building Regulations.

9 Resistance to wind uplift

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

10 Resistance to mechanical damage

The membranes can accept, without damage, the foot traffic and light concentrated loads associated with installation and maintenance. Where traffic in excess of this is envisaged, such as for maintenance of lift equipment, a walkway must be provided (for example, using concrete slabs supported on bearing pads or the manufacturer's walkway sheets). Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads.

11 Maintenance

11.1 The systems should be the subject of six-monthly inspections and maintenance in accordance with BS 6229 : 2018, Chapter 7.

11.2 Where damage has occurred it should be repaired in accordance with section 16 of this Certificate and the Certificate holder's instructions.

12 Durability

12.1 Under normal service conditions, the systems will provide a durable waterproof covering with a service life in excess of 35 years.

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

13 Reuse and recyclability

The membranes are made from bitumen and polyester, which can be recycled.

Installation

14 General

14.1 Installation of Bauder Total 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 and BS 8217 : 2005, and this Certificate.

14.2 Deck surfaces must be dry, clean and free from sharp projections such as nail heads and concrete nibs. The substrate should be prepared using Bauder SA Bonding Primer, Bauder Activator Primer or Bauder Quick Dry Bitumen Primer as specified and at the recommended rate, prior to the installation of the avcl.

14.3 The systems may be laid in conditions normal to roofing work and must not be laid in rain, snow or heavy fog. If the temperature is below 5°C, suitable precautions must be taken against the formation of condensation on the substrate.

14.4 The waterproofing layers must always be installed with staggered overlaps and in such a manner that no counter-seams in the direction of the outlets are made.

14.5 At falls in excess of 5° (1:11) precautions against slippage, and requirements for mechanical fixing as required by BS 8217 : 2005, should be observed. For slopes above 10° (1:5.7) the Certificate holder's Technical Service Department should be contacted for advice.

14.6 Installation of the insulation boards must be carried out in accordance with the insulation manufacturer's instructions.

15 Procedure

15.1 The avcl is rolled out onto the primed substrate, positioned and cut to length. Where thermal break insulation is installed, the avcl must extend up all upstands by a sufficient height to ensure that the insulation is encapsulated.

15.2 The avcl is installed in accordance with the appropriate method for the product, ie torch-bonding for Bauder VB4-Expal and self-adhesion for BauderTHERM DS1 DUO and BauderTEC KSD Mica. BauderTEC KSD Mica has an 80 mm width glass fleece on the underside of one side lap and a thermofusible film on the upper surface of the other side lap. These laps are sealed together using hot air or gas torch to extrude a bituminous bead, to provide waterproofing integrity.

15.3 The underlays are installed by torch bonding for Bauder G4E and self-adhesive application for BauderTEC KSA DUO and BauderTEC KSA DUO 35. The Bauder G4E membrane should be fully torch bonded for a distance of 400 mm at perimeters and at penetrations such as roof-lights, outlets and pipes.

15.4 End laps and side laps for the underlays are 100 mm wide and fully bonded, ensuring that a continuous bead of bitumen exudes from the lap.

15.5 The underlay must be taken a sufficient distance up all upstands and protrusions to ensure a secure lap with the avcl and should be a minimum height of 150 mm above the roof surface.

15.6 Bonding of both the Bauder K5K and Bauder K5E capsheets is achieved by melting their lower surfaces by torching and pressing the membranes down. Care must be taken not to overheat the membranes.

15.7 BauderTEC KSO SN and KSO-P SN detailing capsheets are installed using hot air welding equipment.

15.8 End laps and side laps for the capsheets are 100 mm wide and fully bonded, ensuring that a continuous bead of bitumen exudes from the lap. Laps between the membrane and base sheets should be offset by a minimum of 300 mm.

15.9 The Bauder K5E capsheet must be covered using one of the following protection upon completion:

- at least 50 mm of well-rounded gravel ballast
- pavers on suitable supports
- promenade tiles bonded to the surface with suitable adhesive.

15.10 Detailing should be carried out in accordance with the Certificate holder's instructions and following guidelines specified in the NFRC Safe2Torch Guidance document.

16 Repair

In the event of damage, the capsheets can be effectively repaired, after cleaning the surrounding areas, with a patch of the appropriate capsheet, torch-bonded over the damaged area in accordance with the Certificate holder's instructions.

Technical Investigations

17 Tests

Tests were conducted on the membranes used in Bauder Total Roof Waterproofing Systems and the results assessed to determine:

- thickness
- mass per unit area
- width
- heat resistance
- slippage
- tensile strength and elongation
- nail test
- dimensional stability
- low temperature flexibility
- fatigue cycling
- watertightness
- water vapour transmission
- wind uplift
- static indentation
- dynamic impact
- shear resistance of joints
- peel strength
- effects of heat ageing
- effects of water.

18 Investigations

18.1 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.

18.2 Data on fire performance were assessed.

18.3 Visits were carried out to existing sites to assess the durability of the systems.

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 EN 13162 : 2012 + A1 : 2015 *Thermal insulation products for buildings — Factory made mineral wool (MW) products. Specification*

BS EN 13163 : 2012 +A2:2016 *Thermal insulation products for buildings — Factory made expanded polystyrene (EPS) products. Specification*

BS EN 13165 : 2012 + A2 : 2016 *Thermal insulation products for buildings — Factory made rigid polyurethane foam (PUR) products — Specification*

BS EN 13167 : 2012 + A1 : 2015 *Thermal insulation products for buildings — Factory made cellular glass (CG) products. Specification*

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

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

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

EN 13970 : 2004 *Flexible sheets for waterproofing — Bitumen water vapour control layers — Definitions and characteristics*

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

19 Conditions

19.1 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.

19.2 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.

19.3 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.

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

19.5 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.

19.6 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.

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