Derivados Asfálticos Normalizados S.A (DANOSA)
Polígono Industrial Sector 9
19290 Fontanar
Guadalajara
Spain

Tel: 00 34 949 888 210
e-mail: info@danosa.com
website: www.danosa.com

Agrément Certificate 14/5118
Product Sheet 1 Issue 5

DANOSA SINGLE-PLY ROOF WATERPROOFING MEMBRANES

DANOPOL HS AND DANOPOL+ HS PVC MEMBRANES

This Agrément Certificate Product Sheet(1) relates to DANOPOL HS and DANOPOL+ HS PVC Membranes, a range of reinforced polyvinyl chloride (PVC) membranes, for use in mechanically fastened flat and pitched roofs with limited access, loose-laid and ballasted and roof gardens on flat roofs and green and brown roof systems on flat and pitched roofs.

(1) Hereinafter referred to as '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 products described herein. These products 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: 16 July 2025
Originally certified on 14 April 2014

Hardy Giesler
Chief Executive Officer

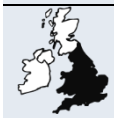
British Board of Agrément
1st Floor, Building 3, Hatters Lane
Croxley Park, Watford
Herts WD18 8YG
tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

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 DANOPOL HS and DANOPOL+ HS PVC Membranes, 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 products are restricted by this Requirement in some circumstances. See section 2 of this Certificate.
Requirement:	**B4(2)**	**External fire spread**
Comment:		The products are restricted by this Requirement. See section 2 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The products, including joints, will enable a roof to satisfy this Requirement. See section 3 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The products are acceptable. See sections 8 and 9 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 products satisfies this Regulation. See sections 8 and 9 of this Certificate.
Regulation:	**9**	**Building standards - construction**
Standard:	2.8	Spread from neighbouring buildings
Comment:		The products are restricted by this Standard with reference to clause 2.8.1(1)(2). See section 2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The products, including joints, will enable a roof to satisfy this Standard, with reference to clauses 3.10.1(1)(2) and 3.10.7(1)(2). See section 3 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The products 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 - conversion**
Comment:		All comments given for the products 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)(i) (iii)(b)(i)**	**Fitness of material workmanship**
Comment:		The products are acceptable. See sections 8 and 9 of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The products, including joints, will enable a roof to satisfy this Regulation. See section 3 of this Certificate.
Regulation:	**36(a)**	**External fire spread**
Comment:		The products are restricted by this Regulation in some circumstances. See section 2 of this Certificate.
Regulation:	**36(b)**	**External fire spread**
Comment:		The products are restricted under this Regulation. See section 2 of this Certificate.

Additional Information

NHBC Standards 2025

In the opinion of the BBA, DANOPOL HS and DANOPOL+ HS PVC Membranes, 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 products, 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 products.

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

The opinion of the BBA does not amount to any endorsement or approval by NHBC and does not in any way guarantee that NHBC will approve such product / system as compliant with the NHBC Technical Requirements and Standards.

Fulfilment of Requirements

The BBA has judged DANOPOL HS and DANOPOL+ HS PVC Membranes to be satisfactory for use in mechanically fastened flat and pitched roofs with limited access, loose-laid and ballasted, and roof gardens on flat roofs, and green and brown roof systems on flat and pitched roofs, as described in this Certificate.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the products under assessment. DANOPOL HS and DANOPOL+ HS PVC Membranes(1) consist of polyester reinforced PVC membranes.

(1) DANOPOL HS is Light grey or White and the DANOPOL+ HS is Dark grey.

The products have the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Products		
	DANOPOL HS 1.2 DANOPOL+ HS 1.2	DANOPOL HS 1.5 DANOPOL+ HS 1.5	DANOPOL HS 1.8 DANOPOL+ HS 1.8
Thickness (mm)	1.2	1.5	1.8
Width (m)	1.08	1.08, 1.80(1)	1.08, 1.80
Length (m)	25	20, 15(1)	17, 13
Mass per unit area ($kg \cdot m^{-2}$)	1.5	1.9	2.3

(1) DANOPOL HS grades only.

Ancillary Items

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

- DANOPOL Colaminated Metal — 0.6 mm galvanized steel sheet coated with 0.6 mm PVC compound, for use in forming details
- DANOPOL H — a non-reinforced PVC membrane, for use in detailing
- Embossed Surfacing Membrane — a low-profile embossed PVC membrane for use in demarcation of maintenance walkways, plant zones and working areas
- 150G Fleece — a needle-punched and calendered polypropylene fleece, for use as a separation layer
- DANOFELT PY 300 — a polyester geotextile, for use as separation or filter layer
- PVC Primer— a polyurethane primer for preparing the surface of existing PVC membranes prior to the application of a polyurethane adhesive
- PVC Contact Adhesive — an adhesive for bonding the PVC membrane to substrates
- DANOBOND Adhesive — a solvent free adhesive
- Pre-formed accessories — a range of corners and pipe collars
- Alpha Profile — a PVC extruded profile for use as a decorative standing seam
- PVC Lightning Clip — a lighting conductor clip to hold a lightning conductor strip, incorporating a PVC membrane flange to allow welding to the waterproofing membrane
- DANODREN JARDIN — a composite board comprising a high-density polyethylene (HDPE), dimple-profiled sheet and
- non-woven geotextile for use as a drainage layer in roof gardens and green roofs
- DANODREN R-20 — a HDPE, dimple-profiled sheet for use as a water retaining layer in roof gardens and green roofs
- DANOLOSA — a paving slab incorporating an extruded polystyrene insulation
- air and vapour control layer (AVCL)
- mineral wool insulation
- polyisocyanurate (PIR) insulation
- mechanical fasteners — a list of tested fasteners is given in ETA 10/0054.

Definitions for products and applications inspected

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

- limited access roof — a roof subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters, etc
- flat roof — a roof having a minimum finished fall of 1:80(1)
- pitched roof — a roof having a fall in excess of 1:6
- roof garden (intensive) – a roof with a substantial layer of growing medium with planting that can include shrubs and trees, and generally accessible to pedestrians
- green roof (extensive) — a roof with a shallow layer of growing medium planted with low-maintenance plants such as mosses, sedums, grasses and some wildflower species
- brown roof — a roof with a growing medium selected to allow indigenous plant species to inhabit the roof over time; no deliberate planting is undertaken
- invasive plant species — vegetation species having vigorous and/or invasive root systems likely to cause damage to components of the inverted roof insulation system and roof waterproofing.

(1) *NHBC Standards* 2025 require a minimum fall of 1:60 for green roofs and roof gardens.

Product assessment – key factors

The products 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 and classified to EN 13501-5 : 2016, the constructions given in Table 2 of this Certificate achieved $C_{ROOF}(t4)$ for any pitch and the constructions given in Table 3 of this Certificate achieved $C_{ROOF}(t4)$.

Table 2 External fire spread tests

Layer	Construction 1(1)	Construction 2(2)
Pitch	All	All
Substrate(3)	≥18 mm thick OSB, of density 590 kg·m^{-3}	≥0.7 mm thick steel deck, of density 7850 kg·m^{-3}
AVCL(3)	0.25 mm thick, HDPE membrane, loose-laid but restrained by mechanical fasteners	0.25 mm thick, HDPE membrane, loose-laid but restrained by mechanical fasteners
Insulation(3)	PIR insulation board with aluminium foil facing, no backing – mechanically fastened single layer 25 to 100 mm thickness double layer 125 to 200 mm thickness	PIR insulation board with aluminium foil facing, no backing – mechanically fastened single layer 25 to 100 mm thickness double layer 125 to 200 mm thickness
Waterproofing	1.2 mm Danopol HS to 1.8 mm Danopol HS mechanically fastened	1.2 mm Danopol HS to 1.8 mm Danopol HS mechanically fastened

(1) Indicative fire test report, fire test report, classification report and extended application report references 21543A, 21543L 21543D and 21543C respectively, conducted by Exova Warringtonfire. Copies are available from the Certificate holder on request.
(2) Indicative fire test report, classification report and extended application report references 21543B, 21543D and 21543C respectively, conducted by Exova Warringtonfire. Copies are available from the Certificate holder on request.
(3) These components are outside the scope of this Certificate.

Table 3 External fire spread tests

Layer	Construction 3(1)	Construction 4(2)
Pitch	≤ 10^0	≤ 10^0
Substrate(3)	≥ 18 mm thick OSB, of density 590 kg·m^{-3}	≥ 0.7 mm thick steel deck, of density 7850 kg·m^{-3}
AVCL(3)	0.25 mm thick, HDPE membrane, loose-laid but restrained by mechanical fasteners	0.25 mm thick, HDPE membrane, loose-laid but restrained by mechanical fasteners
Insulation(3)	Expanded polystyrene (EPS) insulation board of density 32 kg·m^{-3} – mechanically fastened thickness 20 to 200 mm	EPS insulation board of density 32 kg·m^{-3} – mechanically fastened thickness 20 to 200 mm
Insulation(3)	PIR insulation board of density 25 kg·m^{-3} with aluminium foil facing, no backing – mechanically fastened thickness 80 to 100 mm	PIR insulation board of density 25 kg·m^{-3} with aluminium foil facing, no backing – mechanically fastened thickness 80 to 100 mm
Waterproofing	1.2 mm Danopol HS to 1.8 mm Danopol HS mechanically fastened	1.2 mm Danopol HS to 1.8 mm Danopol HS mechanically fastened

(1) Indicative fire test report, test report, classification report and extended application report references 21543 E, 21543 F, 21543 H and 21543 G respectively, conducted by Exova Warringtonfire. Copies are available from the Certificate holder on request.
(2) Indicative fire test report, classification report and extended application report references 21543 M, 21543 H and 21543 G respectively, conducted by Exova Warringtonfire. Copies are available from the Certificate holder on request.
(3) These components are outside the scope of this Certificate.

2.1.2 On the basis of data assessed, the constructions listed in Tables 2 and 3 will be restricted with respect to the proximity to a relevant boundary by the documents supporting the national Building Regulations. The distance to a relevant boundary must be at least 6 m. Restrictions apply at junctions with compartment walls.

2.1.3 A roof incorporating the products will be unrestricted with respect to proximity to a relevant boundary under the national Building Regulations when used in the following circumstances:

- protected or inverted roof specifications, including inorganic covering (eg gravel or paving slabs) listed in the Annex of Commission Decision 2000/553/EC
- a roof garden covered with a drainage layer of gravel 100 mm thick and a soil layer 300 mm thick
- irrigated roof gardens, brown roofs and green roofs.

2.1.4 The classification and permissible areas of use of other specifications must be confirmed by reference to the requirements of the documents supporting the national Building Regulations.

2.1.5 If allowed to dry, plants used may allow the spread of flame across the roof. This must be taken into consideration when selecting suitable plants for the roof. Appropriate planting, irrigation and/or protection must be applied to ensure the overall fire-rating of the roof is not compromised. Further guidance is available in the Department for Communities and Local Government publications, *Fire Performance of Green Roof and Walls*.

2.2 Reaction to fire

2.2.1 The Certificate holder has declared a reaction to fire classification of Class E to UNE EN 13501-1 : 2002 for the products.

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

2.2.3 In England, the products, when used in pitches greater than 70°, excluding upstands, must not be used less than 1 m from a relevant 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 and Northern Ireland, the products, when used in pitches greater than 70°, excluding upstands, must not be used less than 1 m from a relevant 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, the use of the products is unrestricted with respect to building height and proximity to a relevant boundary. However, restrictions on the overall construction may apply, depending on the reaction to fire classification achieved by the build-up, which must be established on a case-by-case basis.

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 4.

Table 4 Weathertightness

Product assessed	Assessment method	Requirement	Result
DANOPOL HS 1.2	Watertightness to EN 1928 : 2001	No leakage	Pass
DANOPOL HS 1.5			Pass
DANOPOL HS 1.2	Water vapour diffusion equivalent air layer thickness (S_d) to BS EN 1931 : 2000	Value achieved	20.76 m
DANOPOL HS 1.5	Peel resistance of joints to EN 12316-2 : 2013	≥ 150 N·(50 mm)$^{-1}$	Pass
DANOPOL HS 1.5	Joint shear resistance to EN 12317-2 : 2010	Break outside of the joint or tensile strength of the sheet	Pass

3.1.2 On the basis of data assessed, the products, 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.

3.1.3 The products, when mechanically fastened, will sufficiently resist the effects of wind suction likely to be experienced in the UK.

3.1.4 The resistance to wind uplift of a mechanically fastened waterproofing layer is provided by the fasteners passing through the membranes 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 membranes
- appropriate calculation of safety factors.

3.1.5 The wind uplift forces must be calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. The number of fixings required must be established using a maximum permissible load of 0.4 kN per fixing.

3.1.6 When the products are bonded to insulation boards, the resistance to wind uplift will be dependent on the cohesive strength of the insulation and the method by which the insulation is secured to the roof deck. This must be taken into account when selecting suitable insulation material.

3.2 Resistance to mechanical damage

3.2.1 Results of resistance to mechanical damage tests are given in Table 5.

Table 5 Mechanical damage

Product assessed	Assessment method	Requirement	Result
DANOPOL HS 1.2	Tensile strength to BS EN 12311-2 : 2013		
	Longitudinal direction	≥1000 N·(50 mm)$^{-1}$	Pass
	Transverse direction	≥1000 N·(50 mm)$^{-1}$	Pass
DANOPOL HS 1.5	Longitudinal direction	≥1100 N·(50 mm)$^{-1}$	Pass
	Transverse direction	≥1000 N·(50 mm)$^{-1}$	Pass
DANOPOL HS 1.2	Elongation to BS EN 12311-2 : 2013		
	Longitudinal direction	≥ 15%	Pass
	Transverse direction	≥ 15%	Pass
DANOPOL HS 1.5	Longitudinal direction	≥ 20%	Pass
	Transverse direction	≥ 20%	Pass
DANOPOL HS 1.2	Resistance to tearing (nail shank) to BS EN 12310-1 : 2000		
	Longitudinal direction	≥ 200 N	Pass
	Transverse direction	≥ 200 N	Pass
DANOPOL HS 1.5	Longitudinal direction	≥ 250 N	Pass
	Transverse direction	≥ 250 N	Pass
DANOPOL HS 1.2	Resistance to impact to BS EN 12691 : 2006	Value achieved	700 mm
DANOPOL HS 1.2	Static indentation to	Value achieved	
- on a hard substrate	MOAT 65: 4.3.8 : 2001		L_4
- on a soft substrate			L_2
DANOPOL HS 1.5	Low temperature flexibility to BS EN 495-5 : 2013	≤-30°C	Pass

3.2.2 On the basis of data assessed, the products can accept, without damage, the limited foot traffic and light concentrated loads associated with installation and maintenance. Reasonable care must be taken to avoid puncture by sharp objects or concentrated loads.

3.2.3 Where regular traffic is envisaged, such as for maintenance of lift equipment, a walkway must be provided such as concrete slabs supported on bearing pads). The advice of the Certificate holder must be sought on the most appropriate method to be used with the amount of traffic involved, but such advice is outside the scope of this Certificate.

3.2.4 Systems incorporating the products are capable of accepting minor structural movement while remaining weathertight.

3.3 Resistance to root penetration

3.3.1 The result of a resistance to root penetration test is given in Table 6.

Table 6 Root penetration

Product assessed	Assessment method	Requirement	Result
DANOPOL HS 1.2	Resistance to root penetration to UNE-EN 13948 : 2008	No root penetration after two years	Pass

3.3.2 On the basis of data assessed, the products will adequately resist penetration by plant roots and can be used as a waterproofing system in green roof, brown roof and roof garden specifications.

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 products contain PVC and polyester, which can be recycled.

8 Durability

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

8.2 Specific test data were assessed as given in Table 7.

Table 7 Durability

Product assessed	Assessment method	Requirement	Result
DANOPOL HS 1.5	Peel resistance of joints to EN 12316-2 : 2013 Heat aged for 168 days at 70°C	≤ 20% deterioration on unaged result	Pass
DANOPOL HS 1.2	Dimensional stability to BS EN 1107-2 : 2001	≤0.5%	
	Longitudinal direction		Pass
	Transverse direction		Pass
	Longitudinal direction		Pass
DANOPOL HS 1.5	Transverse direction		Pass
DANOPOL HS 1.5	Low temperature foldability to EN 495-5 : 2013	≤ 2% deterioration on	
	Heat aged for 168 days at 70°C	unaged result	Pass
	UV aged to EN 1297 : 2004		Pass
	Low temperature foldability to BS EN 495-5 : 2013	≤ 2% deterioration on	
	Sample from site	unaged result	
	As received		Pass
	Heat aged for 120 days at 80°C		Pass
DANOPOL HS 1.5	Joint shear resistance to EN 12317-2 : 2010 Heat aged for 168 days at 70°C	≤ 20% deterioration on unaged result	Pass
DANOPOL HS 1.5	Dynamic indentation to EOTA TR-006 : 2004	Value achieved	
	Sample from site		
	As received		I_3
	Heat aged 120 days at 80°C		I_3
	UV aged to TR-010 : 2004		I_3

8.3 Service life

8.3.1 Under normal service conditions, the products will have a life in excess of 35 years, provided they are designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

8.3.2 In environments where the products are in contact with organic solvents, the life expectancy of the products may be reduced. In cases of doubt, the advice of the Certificate holder must be sought, but such advice is outside the scope of this Certificate.

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 by the BBA, and the following requirements apply in order to satisfy the performance assessed in this Certificate.

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

9.1.3 Decks to which the products are to be applied must comply with the relevant requirements of BS 6229 : 2018, BS 8217 : 2005 and, where appropriate, *NHBC Standards* 2025, Chapter 7.1.

9.1.4 For loose-laid and ballasted, green roofs, brown roofs and roof gardens, structural decks to which the products are to be applied must be suitable to transmit the dead and imposed loads experienced in service. Allowance must be made for loading deflections to ensure that the free drainage of water is maintained.

9.1.5 The ballast requirements for loose-laid systems must be calculated by a suitably experienced and competent individual in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex. The membranes must always be ballasted with a minimum depth of 50 mm of aggregate. In areas of high-wind exposure, the advice of the Certificate holder must be sought, but such advice is outside the scope of this Certificate. Alternatively, concrete slabs on suitable supports can be used.

9.1.6 Imposed loads, dead loading and wind loads must be calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003 and BS EN 1991-1-4 : 2005, and their UK National Annexes.

9.1.7 Any ballast used in roofing specifications and growing medium used in green roofs, brown roofs and roof gardens must not be of a type that will be removed or become delocalised due to wind scour experienced on the roof.

9.1.8 It must be recognised that the type of plants used in roof gardens could significantly affect the expected wind loads experienced in service.

9.1.9 For green roofs, brown roofs and roof gardens, invasive non-native alien plant species as defined by UK Government guidance must not be used.

9.1.10 For green roof, brown roofs and roof garden finishes, to protect the roof waterproofing, invasive plant species must not be used. In particular, the following species must be excluded:

- invasive weeds including buddleia
- plants and grasses with aggressive rhizomes such as bamboo
- self-setting woody weeds such as sycamore and ash seedlings must be removed at early germination stage
- other woody plants which spread aggressively including rhododendron.

9.1.11 The Green Roof Organisation (GRO) can provide guidance on species not included in section 9.1.10 but such advice is outside the scope of this Certificate.

9.1.12 The drainage system for green roofs, brown roofs or roof gardens must be correctly designed, and the following points must be addressed:

- provision made for access for maintenance purposes
- dead loads for green roof and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer.

9.1.13 The products can be adversely affected by contact with bituminous or coal tar products or polystyrene insulation boards. In these cases, a suitable separating layer must be used. Where doubt arises, the advice of the Certificate holder must be sought, but such advice is outside the scope of this Certificate.

9.1.14 Insulation materials to be used in conjunction with the products 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 scope 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 of the systems must be carried out in accordance with the relevant clauses of the Certificate holder's instructions, BS 8000-0 : 2014, BS 8000-4 : 1989 , BS 6229:2018 and this Certificate.

9.2.3 Surfaces must be clean, dry, and free from sharp projections such as nail heads, concrete nibs. In all cases, an AVCL must be used directly over the deck.

9.2.4 The products must be laid in conditions normal to roofing work. To prevent the entrapment of moisture under the products, they must not be laid in wet or damp weather conditions, or at temperatures below 5°C.

9.2.5 Soil or other bulk material must not be stored on one area of the roof prior to the installation, to ensure localised overloading does not occur.

9.2.6 All flashings must be formed in accordance with the Certificate holder's instructions.

9.2.7 Thermal insulation must be dimensionally stable and be capable of supporting the imposed loads during the installation and service without undue deflection. For mechanically fixed applications, insulation boards must have a high resistance to point loading. The Certificate holder must be consulted for advice on suitable insulation materials, but such advice and products are outside the scope of this Certificate.

9.2.8 The membranes are laid flat onto the substrate without folds or ripples, starting at the lowest point of the roof slope and perpendicular to the line of maximum slope of the roof, forming a row of sheeting with 100 mm minimum overlaps.

9.2.9 Where mechanically fastened, the membranes are fastened to the deck by fasteners and plates in the overlap of the membranes. The fastener plates are set 10 mm from the edge of the lower membrane.

9.2.10 The position and the number of fasteners required must be in accordance with the fixing specifications provided by the Certificate holder.

9.2.11 The membrane must be fixed at roof penetrations and at roof perimeters and made wind-tight to prevent the rapid intrusion of air under the membrane. The Certificate holder must be consulted for advice on suitable fixings and detail specifications, but such advice is outside the scope of this Certificate.

9.2.12 Joints are produced by hot-air welding in accordance with the Certificate holder's instructions. The weld must have a minimum width of 40 mm.

9.2.13 For ballasted applications, prior to the application of the ballast, a protection layer consisting of at least 0.2 mm thick polyethylene must be laid. The Certificate holder must be consulted for advice on suitable specifications, but such advice and products are outside the scope of this Certificate.

9.2.14 The membranes are laid flat onto the substrate without folds or ripples.

9.2.15 When forming joints, lap joints in the membrane must be a minimum of 100 mm wide at sheet ends and details. Edge overlaps with adjacent sheets must be a minimum of 100 mm, welded over the last 40 mm as described in section 9.2.12.

9.2.16 The membranes must be covered by at least a 50 mm depth of well-rounded gravel. In areas of high wind exposure, paving slabs set on a suitable support may be considered.

9.2.17 When using a loose-laid application, normal account must be taken in the design of the deck of the extra dead loading due to the weight of the aggregate and/or paving.

9.2.18 In green roof, brown roof and roof garden specifications, subsequent layers such as separation layers, drainage layers and growing medium are installed in accordance with the Certificate holder's instructions. Guidance is also available within The GRO Green Roof Code — *Green Roof Code of Best Practice for the UK.*

9.2.19 Upstands and detailing of the membrane must be in accordance with the Certificate holder's instructions.

9.2.20 The NHBC requires that the products, once installed, are inspected in accordance with *NHBC Standards* 2025, Chapter 7, Clause 7.1.11, and undergo an appropriate integrity test where required. Any damage to the products assessed in this Certificate must be repaired in accordance with section 9.4 of this Certificate and reinspected, in order to maintain product performance.

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 products must be carried out by installers trained and approved by the Certificate holder.

9.4 Maintenance and repair

9.4.1 Ongoing satisfactory performance of the products 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 achieve the performance assessed in this Certificate:

9.4.2.1 The products must be the subject of six-monthly inspections and maintenance in accordance with BS 6229 : 2018, Chapter 7 and the Certificate holder's own maintenance recommendations, where relevant. For green roof, brown roof and roof garden systems, these six-monthly inspections must be carried out by a suitably experienced and competent individual (with horticultural knowledge) to ensure continued satisfactory performance. This must include an examination of the overall condition of the roof, ensure that drain outlets and gutters are kept clear and unblocked and, for green roofs and roof gardens, the removal of any self-propagated plants and invasive plant species found. See section 9.1.11.

9.4.2.2 Green roofs , brown roofs and roof gardens must be the subject of regular inspections, particularly in autumn after leaf fall and in spring, to ensure unwanted vegetation and other debris is cleared from the roof and drainage outlets. Guidance is available within the latest edition of *The GRO Green Roof Code of Best Practice*.

9.4.2.3 For green roofs and brown roofs, to protect the roof waterproofing and any product components above the waterproofing, such as insulation or water flow reducing layer, invasive plant species (see sections 9.1.10 and 9.1.11) must be eliminated through maintenance.

9.4.2.4 The control and removal of invasive plant species is carried out by hand. Where this is not possible, any chemicals used, such as chemical fertilisers, must be checked for compatibility with the roof waterproofing layer and any product components above the waterproofing. The Certificate holder can advise on the suitability of a particular product, but such advice is outside the scope of this Certificate.

Note: If using chemicals on a green roof or roof garden rainwater outlets may need to be disconnected from the main drainage system to prevent contamination of the local water system and/or harm to flora and fauna.

9.4.2.5 If a leak occurs in the roof waterproof membrane, it must be repaired following removal of the gravel ballast, paving ballast, green roof, brown roof or roof garden layer, water-flow-reducing layer and the insulation boards.

9.4.2.6 Where damage has occurred it must be repaired in accordance with this Certificate and the Certificate holder's instructions.

9.4.2.7 In the event of damage, repairs can be carried out by cleaning around the damaged area and hot air welding a new patch of membrane. The patch must have rounded corners and be larger than the damaged area by at least 50 mm in each direction.

10 Manufacture

10.1 The production processes for the products 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 products are delivered to site in rolls wrapped in polythene on pallets, bearing the Certificate holder's name and address, product identification, batch number, CE marking and the BBA logo incorporating the number of this Certificate.

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 horizontally on a clean, dry, level surface and under cover until required.

ANNEX A – SUPPLEMENTARY INFORMATION †

Supporting information in this Annex is relevant to the products 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 products under the *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 products in accordance with harmonised European Standard EN 13956 : 2012 and ETA 10/0054 under ETAG 006 : 2000 acting as a European Assessment Document.

Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of EN ISO 9001 : 2015 and EN ISO 14001 : 2015 by Bureau Veritas Certification (Certificates ES083321-1 and ES091096-1 respectively).

Additional Guidance

Design

A.1 Recommendations for the design of green roof, brown roof and roof garden specifications are available within the latest edition of The GRO Green Roof Code — *Green Roof Code of Best Practice for the UK.*

Installation

A.2 The products may be applied over foil-faced insulation materials and fixed to the sub-structure in such a way as not to impair the performance of the waterproofing. Polystyrene-based insulation products may also be used in conjunction with a suitable isolation layer to separate the insulation from the roof covering, to reduce the risk of plasticiser migration.

Maintenance

A.3 Additional guidance on maintenance for green roofs is available within the latest edition of the GRO Green Roof Code – *Green Roof Code of Best Practice for the UK.*

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 1107-2 : 2001 *Flexible sheets for waterproofing — Determination of dimensional stability — Part 2 : Plastic and rubber sheets for roof waterproofing*

BS EN 1931 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of water vapour transmission properties*

BS EN 1991-1-1 : 2002 *Eurocode 1 : Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*
NA to BS EN 1991-1-1 : 2002 *UK National Annex to Eurocode 1 : Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*
BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 : Actions on structures — General actions — Snow loads*
NA + A2 : 18 to BS EN 1991-1-3 : 2003 + A1 : 2015 *UK National Annex to Eurocode 1 : Actions on structures — General actions — Snow loads*
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 12310-1 : 2000 *Flexible sheets for waterproofing – Determination of resistance to tearing (nail shank) – Part 1 : Bitumen sheets for roof waterproofing*
BS EN 12311-2 : 2013 *Flexible sheets for waterproofing – Determination of tensile properties – Part 2 : Plastic and rubber sheets for roof waterproofing*

BS EN 12691 : 2006 *Flexible sheets for waterproofing – Bitumen, plastic and rubber sheets for roof waterproofing – Determination of resistance to impact*

BS EN 495-5 : 2013 *Flexible sheets for waterproofing — Determination of foldability at low temperature Part 5: Plastic and rubber sheets for roof waterproofing*

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

EN 495-5 : 2013 *Flexible sheets for waterproofing — Determination of foldability at low temperature Part 5: Plastic and rubber sheets for roof waterproofing*

EN 1297 : 2004 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Method of artificial ageing by long term exposure to the combination of UV radiation, elevated temperature and water*

EN 1928 : 2001 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of watertightness*

EN 12316-2 : 2013 *Flexible sheets for waterproofing — Determination of peel resistance of joints — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 12317-2 : 2010 *Flexible sheets for waterproofing — Determination of shear resistance of joints — Part 2 : Plastic and rubber sheets for roof waterproofing*

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

EN 13956 : 2012 *Flexible sheet for waterproofing — Plastic and rubber sheets for roof waterproofing — Definitions and characteristics*

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

EN ISO 14001 : 2015 *Environmental management systems — Requirements with guidance for use*

EOTA TR-006 : 2004 Determination of the resistance to dynamic indentation

ETAG 006 : 2000 *Guideline for European Technical Approval of Systems of Mechanical Fastened Flexible Roof Waterproofing Membranes*

MOAT 65 : 2001 *UEAtc Technical Guide for the Assessment of non-Reinforced, Reinforced and/or Backed Roof Waterproofing Systems made of PVC*

TR-010 : 2004 *Exposure procedure for artificial weathering*

UNE- EN 13501-1 : 2002 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*

UNE-EN 13948 : 2008 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to root penetration*

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
- and any matter arising out of or in connection with it or its subject matter (including non-contractual disputes or claims) is governed by and construed in accordance with the law of England and Wales.
- the courts of England and Wales shall have exclusive jurisdiction to settle any matter arising out of or in connection with this Certificate or its subject matter (including non-contractual disputes or claims).

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.

British Board of Agrément
1st Floor, Building 3, Hatters Lane
Croxley Park, Watford
Herts WD18 8YG
tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk