

DURADAN HOT-APPLIED WATERPROOFING SYSTEM

DURADAN HOT MELT STRUCTURAL WATERPROOFING

This Agrément Certificate Product Sheet⁽¹⁾ relates to DURADAN Hot Melt Structural Waterproofing, a hot-applied modified bitumen, reinforced with a woven glass fibre polyester mesh, for use in conjunction with bitumen roofing cap sheets for use on protected flat roofs, including zero fall, blue roofs (in combination with a stormwater attenuation system)⁽²⁾, inverted roofs, green roofs and roof gardens with limited or pedestrian access.

(1) Hereinafter referred to as 'Certificate'.

(2) The stormwater attenuation system is outside the scope of this Certificate.

The assessment includes

Product factors:

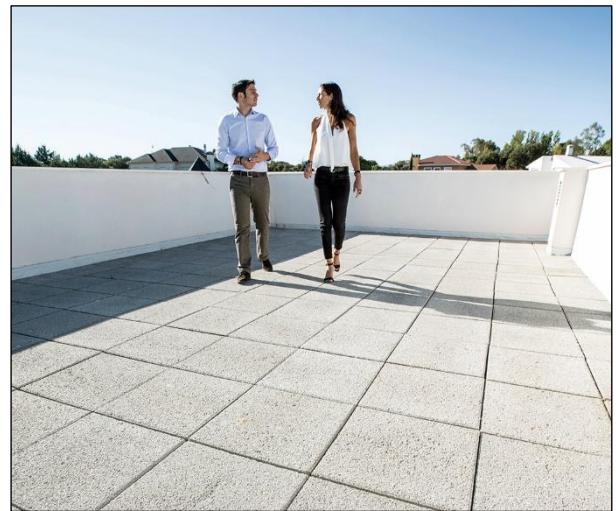
- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

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 system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 23 January 2025

Originally certified on 16 December 2020

Certificate amended on 5 March 2026 to update company name and to add NHBC statement.



Hardy Giesler
Chief Executive Officer

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.

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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 DURADAN Hot Melt Structural Waterproofing, 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(2)	External fire spread
Comment:		Roofs incorporating the system, when used with suitable surface protection, may be unrestricted by this Requirement. See section 2 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The system will enable a roof to satisfy this Requirement. See section 3 of this Certificate.
Regulation:	7(1)	Materials and workmanship
Comment:		The system is 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 system satisfies this Regulation. See sections 8 and 9 of this Certificate.
Regulation:	9	Building standards – construction
Standard:	2.8	Spread from neighbouring buildings
Comment:		Roofs incorporating the system, when used with suitable surface protection, may enable a roof to be unrestricted by this Standard, with reference to clause 2.8.1 ⁽¹⁾⁽²⁾ . See section 2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system 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 system 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:		Comments given for the system 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)(ii)	Fitness of materials and workmanship
Comment:	(iii)(iv)(b)(i)	The system is acceptable. See sections 8 and 9 of this Certificate.

Regulation:	28(b)	Resistance to moisture and weather
Comment:		The system will enable a roof to satisfy this Regulation. See section 3 of this Certificate.
Regulation:	36(b)	External fire spread
Comment:		Roofs incorporating the system, when used with suitable surface protection, may be unrestricted by this Regulation. See section 2 of this Certificate.

Additional Information

NHBC Standards 2025

In the opinion of the BBA, DURADAN Hot Melt Structural Waterproofing, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards, 7.1 Flat roofs, terraces and balconies*.

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

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 DURADAN Hot Melt Structural Waterproofing to be satisfactory for use as described in this Certificate. The system has been assessed for use in conjunction with bitumen roofing cap sheets on protected flat roofs, including zero fall, blue roofs (in combination with a stormwater attenuation system), inverted roofs, green roofs and roof gardens with limited access or pedestrian access.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the system under assessment. DURADAN Hot Melt Structural Waterproofing consists of a hot-applied modified bitumen, reinforced with a woven glass fibre polyester mesh, used in conjunction with bitumen roofing cap sheets. The system consists of:

- BITUMEN PRIMER HM — a cold applied solvent-based bituminous primer, for use in the preparation of substrates prior to the application of the waterproofing system
- DURADAN ELAST 110/50 — a hot-applied, non-toxic, monolithic polymer-modified bitumen, used as an adhesive to bond the cap sheet
- DURADAN REINFORCEMENT MESH — a woven glass fibre reinforcement (79 g·m⁻²), which is embedded in the DURADAN ELAST 110/50 compound
- POLYDAN PRO 40/HM GARDEN — a polyester-reinforced bitumen cap sheet with root inhibitor, for use as an anti-root layer in green roof applications. The cap sheet has a polypropylene fabric finish on the upper and lower surfaces.
- POLYDAN PRO 40/HM⁽¹⁾ — a polyester-reinforced bitumen cap sheet with a polypropylene fabric finish on the upper and lower surfaces.

(1) Not to be used in green roof, biodiverse roof, brown roof and roof garden specifications.

POLYDAN PRO 40/HM GARDEN and POLYDAN PRO 40/HM cap sheets have the nominal characteristics given in Table 1.

Table 1 Nominal characteristics of cap sheets

Characteristic (unit)	Components	
	POLYDAN PRO 40/HM GARDEN	POLYDAN PRO 40/HM
Thickness (mm)	3.5	3.5
Roll width (m)	1	1
Roll length (m)	10	10
Mass per unit area (kg·m ⁻²)	4.0	4.0
Surface finish		
Lower	polypropylene fabric	polypropylene fabric
Upper	polypropylene fabric	polypropylene fabric

Ancillary Items

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

- DANOFELT PY 300 used as either a protection or as a separation layer between incompatible and/or abrasive products
- Lightning Cable Clip for the securement of lighting conductor tape to roof systems
- DANODREN JARDÍN for drainage applications
- DANODREN R-20 for water retention and drainage applications
- DANOLOSA for mechanical protection and thermal insulation.

Applications

The system is intended for use as a protected waterproofing system on flat roofs, including zero fall, with limited access in:

- inverted roof specifications using aggregate ballast and paving with limited access
- protected roof specifications, e.g. covered by paving or other suitable protection
- green roofs (extensive), biodiverse roof and brown roof specifications with limited access and roof garden (intensive) specifications⁽¹⁾
- blue roof specifications⁽²⁾.

(1) The system is only approved in these specifications when POLYDAN PRO 40/HM Garden is used as a cap sheet.

(2) The stormwater attenuation system is outside the scope of this Certificate

The system is suitable for use on the following substrates:

- in-situ structural concrete
- precast concrete
- concrete block in vertical applications
- lightweight structural concrete
- new exterior grade plywood (to BS EN 636 : 2012, Clause 8), fixed in accordance with the relevant requirements of BS 6229 : 2018 and BS 8217 : 2005.

The substrates must comply with the relevant requirements of BS 6229 : 2018 and where appropriate, *NHBC Standards 2025*, Chapter 7.1.

Definitions for products and applications inspected

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

- flat roof — a roof having a minimum finished fall of 1:80⁽¹⁾
- zero fall roof — a roof having a finished fall which can vary between 0 and 1:80⁽¹⁾
- pitched roof — a roof having a fall in excess of 1:6
- limited access roof — a roof subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters etc

- pedestrian access roof — a roof not subjected to vehicular traffic
- roof garden (intensive) — a roof with a substantial layer of growing medium with planting that can include shrubs and trees, generally accessible to pedestrians
- green roof — 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 (intensive or extensive) — a roof with a growing medium selected to allow indigenous plant species to inhabit the roof over time; no deliberate planting is undertaken
- biodiverse roof (extensive or intensive) — a roof planted with the aim either to recreate the habitat that was lost when a building was erected or to replicate it
- 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
- blue roof — a flat roof designed to allow controlled attenuation of rainfall during heavy storm events, as part of sustainable urban drainage systems (SUDS)⁽²⁾.

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

(2) The storm water attenuation system is outside the scope of this Certificate.

Product assessment – key factors

The system was assessed for the following key factors, and the outcome of the assessment 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 A roof incorporating the system 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 (e.g. 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, green roofs, biodiverse roofs and brown roofs.

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

2.1.3 If allowed to dry, plants used in a roof garden may allow flame spread 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.

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 2.

Table 2 Weathertightness

Product assessed	Assessment method	Requirement	Result
DURADAN ELAST 110/50 reinforced with DURADAN REINFORCEMENT MESH	Watertightness under 60 kPa pressure to BS EN 1928 : 2000	No leakage	Pass
DURADAN ELAST 110/50 reinforced with DURADAN REINFORCEMENT MESH	Water vapour diffusion - equivalent air layer thickness to BS EN 1931 : 2000 (S_d)	Value achieved	574 m

3.1.2 On the basis of the data assessed, the system will adequately resist the passage of moisture into the interior of a building and so satisfy the relevant requirements of the national Building Regulations.

3.1.3 The system will 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 3.

Table 3 Resistance to mechanical damage

Product assessed	Assessment method	Requirement	Result
DURADAN REINFORCEMENT MESH	Tensile strength to BS EN 29073-3 : 1992	Value achieved	504 N
			1548 N
POLYDAN PRO 40/HM GARDEN	Longitudinal direction	Value achieved	829 N
			531 N
DURADAN REINFORCEMENT MESH	Elongation to BS EN 29073-3 : 1992	Value achieved	1.2%
			2.5%
POLYDAN PRO 40/HM GARDEN	Longitudinal direction	Value achieved	41.2%
			54.3%
DURADAN Hot Melt Structural Waterproofing (with POLYDAN PRO 40/HM GARDEN cap sheet) on steel	Static indentation to EOTA TR-007 : 2004 Tested at 23°C	Value achieved	L ₄
DURADAN Hot Melt Structural Waterproofing (with POLYDAN PRO 40/HM GARDEN cap sheet) on steel	Dynamic indentation to EOTA TR-006 : 2004 Tested at 23°C Tested at -10°C	Value achieved	L ₄
			L ₄
DURADAN Hot Melt Structural Waterproofing (with POLYDAN PRO 40/HM cap sheet)	Fatigue movement to EOTA TR-008 : 2004 (1000 cycles, -10°C)	Watertight and less than 75 mm delamination from the substrate	Pass
DURADAN ELAST 110/50	Low temperature flexibility to BS EN 15813 : 2011	Value achieved	0°C

3.2.2 On the basis of data assessed, the system can accept, without damage, the limited foot traffic and light concentrated loads associated with installation and maintenance and the effects of minor structural movement while remaining weathertight.

3.2.3 Where traffic in excess of the examples given in 3.2.2 is envisaged, such as for maintenance of lift equipment, a walkway must be provided (for example, using concrete slabs supported on bearing pads). Reasonable care must be taken to avoid puncture of the membranes by sharp objects or concentrated loads.

3.2.4 When used over construction joints and minor cracks, the system can accommodate the minor structural movements likely to occur in service.

3.3 Resistance to root penetration

3.1.1 The resistance to root penetration of POLYDAN PRO 40/HM GARDEN was assessed using test data from a representative related system and was satisfactory.

3.1.2 In green roofs, when installed in accordance with this Certificate, the inverted roof insulation, water-flow-reducing layer (WFRL), and roof waterproofing layer will be adequately protected against root damage, subject to routine maintenance being carried out in accordance with this Certificate and as recommended by the Green Roof Organisation (GRO) *Code of Best Practice*.

3.1.3 In roof gardens, when installed in accordance with this Certificate, the inverted roof insulation, water-flow-reducing layer (WFRL), and roof waterproofing layer, must be protected from damage from invasive plant roots, for example, by using root resistant planter boxed or tree pits lined with an effective root barrier.

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

Not applicable.

8 Durability

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

8.2 Specific test data were assessed as given in Table 4.

Table 4 Durability

Product assessed	Assessment method	Requirement	Result
DURADAN Hot Melt Structural Waterproofing (with POLYDAN PRO 40/HM cap sheet)	Fatigue movement to EOTA TR-008 : 2004 (50 cycles, -10°C) Heat aged at 70°C for 200 days	Watertight and less than 75 mm delamination from the substrate	Pass

8.3 Other aspects of durability were assessed using test data from representative related products.

8.4 Service life

Under normal service conditions, the system will have a life of at least equivalent to the structure in which it is incorporated, provided it is designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

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 specified in this Certificate.

9.1.2 Decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018 and, where appropriate, *NHBC Standards 2025*, Chapter 7.1.

9.1.3 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, direction of falls etc.

9.1.4 Structural decks to which the system is to be applied must be suitable to transmit the dead and imposed loads experienced in service. Allowance needs to be made for loading deflections to ensure that the free drainage of water is maintained.

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

9.1.6 It must be recognised that the type of plants used in green roofs and roof gardens could significantly affect the expected wind loads in service.

9.1.7 The ballast on protected roofs or growing media used in planting must not be of a type that will be removed or become delocalised owing to wind scour experienced on site.

9.1.8 For green roofs and roof gardens, invasive non-native alien plant species as defined by UK Government guidance 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 should be removed at early germination stage
- other woody plants which spread aggressively including Rhododendron.

9.1.9 The Green Roof Organisation (GRO) can provide guidance on species not included in section 9.1.8 but such advice is outside of the scope of this Certificate.

9.1.10 Where a root resistant planter box is installed over the inverted roof insulation and water-flow-reducing-layer (WFRL) a suitable drainage board must be installed beneath the planter box to allow the inverted roof system to function correctly, the planter box to drain and to enable rainwater to reach drainage outlets without impediment.

9.1.11 For roof garden finishes, POLYDAN PRO 40/HM GARDEN, must be used as a root barrier and laps in the root barrier must be sealed using a suitable root barrier tape or be welded.

9.1.12 The drainage systems for green roofs, roof gardens, inverted roofs and zero fall roofs must be correctly designed, and the following points should be addressed:

- provision made for access for maintenance purposes
- for zero falls, it is particularly important to identify the correct drainage points, to ensure that drainage is sufficient and effective in accordance with the relevant clauses of BS 6229 : 2018
- dead loads for green roofs and roof gardens can increase if the drains become partially or completely blocked causing waterlogging of the drainage layer.

9.1.13 Insulation materials to be used in conjunction with the system 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.

9.1.14 The ballast requirements for inverted specifications must be calculated by a suitably experienced and competent individual in accordance with the principles of BS EN 1991-1-4 : 2005 and its UK National Annex. The system must be ballasted with a minimum depth of 50 mm of aggregate. In areas of high wind exposure, the Certificate holder's advice must be sought, but this application is outside the scope of this Certificate. Alternatively, concrete slabs on suitable supports can be used.

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 and the Certificate holder's instructions and the relevant clauses of BS 6229 : 2018, BS 8000-0 : 2014, BS 8000-4 : 1989, BS 8217 : 2005 and the *Liquid Roofing and Waterproofing Association (LRWA) Note 7 – Specifier Guidance for Flat Roof Falls*. A summary of instructions and guidance is provided in Annex A of this Certificate.

9.2.3 The system must be installed on a dry and frost-free substrate. After rain or snow, the substrate must be allowed to dry before installation commences. The installing contractor can aid drying by suitable means approved by the Certificate holder.

9.2.4 The surface of the concrete substrate must be sound and free from contaminants, with a surface finish in accordance with the Certificate holder's criteria.

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

9.2.6 The substrate must be primed using BITUMEN PRIMER HM at a nominal coverage rate of $5 \text{ m}^2 \cdot \text{l}^{-1}$, dependent on the substrate porosity, and allowed to dry.

9.2.7 DURADAN ELAST 110/50 blocks are heated in an air jacketed boiler or a thermostatically controlled bitumen boiler to a temperature of approximately 180°C , with a maximum allowable temperature of 205°C . Overheating of the hot melt compound must be avoided.

9.2.8 DURADAN REINFORCEMENT MESH is unrolled over the primed substrate, with overlaps of 100 mm minimum at the sides and end of a roll.

9.2.9 The DURADAN ELAST 110/50 hot-melt compound is poured through the reinforcement at an application rate of $3 \text{ kg} \cdot \text{m}^{-2}$ ensuring that the reinforcement is fully encapsulated by the hot-melt.

9.2.10 POLYDAN PRO 40/HM GARDEN or POLYDAN PRO 40/HM is immediately unrolled into the hot melt compound with overlaps of 80 mm at the side and 100 mm at the end. The cap sheets must always be installed with end laps staggered a minimum of 300 mm and in such a manner that no counter-seams in the direction of outlets are made. Excess compound may extrude from the edges of the cap sheet. The cap sheet must be fully bonded to the hot melt.

9.2.11 Excessive re-melting and prolonged heating of DURADAN ELAST 110/50 must be avoided.

9.2.12 Upstands and other detailing must be carried out in accordance with the Certificate holder's installation instructions.

9.2.13 The NHBC requires that the system, once installed, is inspected in accordance with *NHBC Standards 2025*, Chapter 7.1, Clause 7.1.11, including undergoing an appropriate integrity test, where required. Any damage to the system assessed in this Certificate must be repaired in accordance with section 9.4 of this Certificate and reinspected, in order to maintain system performance.

9.3 Workmanship

Practicability of installation was assessed, on the basis of the Certificate holder's information and BS 8217 : 2005. To achieve the performance described in this Certificate, installation of the system 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 system in use requires that it is 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 system must be the subject of visual six-monthly inspections and maintenance in accordance with the recommendations in BS 6229 : 2018, Chapter 7, and the Certificate holder's own maintenance requirements. For green roof and drainage systems, These 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 condition of the roof, ensure that drain outlets and gutters are kept clear and unblocked and the removal of any self-propagated plants and invasive plant species found (see section 9.1.9).

9.4.2.2 Green roofs, biodiverse 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, to protect the water-flow-reducing-layer (WFRL), inverted roof insulation and the roof waterproofing, invasive plant species (see sections 9.1.8 and 9.1.9 of this Certificate) 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 must be checked for compatibility with the roof waterproofing layer. 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, 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 The chemical fertiliser used on green roofs and roof gardens must be checked for compatibility with the insulation, water-flow- reducing layer and roof waterproofing layer. The Certificate holder can advise on the suitability of a particular product, but such advice and products are outside the scope of this Certificate.

9.4.2.6 If a leak occurs in the roof waterproof membrane, it must be repaired following removal of the gravel ballast, paving ballast, green roof or roof garden layer, water-flow-reducing layer and the insulation boards. Correct reinstatement of these layers must be carried out, taking care not to damage the water-flow-reducing layer.

9.4.2.7 In the event of minor damage, the cap sheet can be fully repaired with an additional patch of the applicable cap sheet bonded to the damaged area using the appropriate installation method.

10 **Manufacture**

10.1 The production processes for the system 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 DURADAN ELAST 110/50 hot melt compound is delivered to site in blocks packaged in silicon-lined cardboard cartons with labels bearing the product name, weight, date of production, batch number, address of the Certificate holder and the BBA logo incorporating the number of this Certificate.

11.2 BITUMEN PRIMER HM is delivered in 25 litre drums.

11.3 POLYDAN PRO 40/HM GARDEN and POLYDAN PRO 40/HM are delivered in 10 m rolls.

11.4 DURADAN REINFORCEMENT MESH is delivered in 50 m rolls.

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

11.5.1 DURADAN ELAST 110/50 and BITUMEN PRIMER HM must be stored under cover and away from heat sources.

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

Supporting information in this Annex is relevant to the system 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 system components 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 bitumen membranes used in the system in accordance with harmonised European Standard EN 13707 : 2013.

Management Systems Certification for production

The management system of the manufacturer of has been assessed and registered as meeting the requirements of ISO 9001 : 2015 by ANEOR (Certificate ES-0140/2014) and Bureau Veritas Certification (ES114056-2).

Additional information on installation

A.1 When designing a zero fall roof Reference should also be made to the appropriate clauses in Liquid Roofing and Waterproofing Association (LRWA) Note 7 — *Specifier Guidance for Flat Roof Falls*

A.2 Guidance on the design of blue roofs is available in *NFRC Technical Guidance Note for the construction and design of Blue Roofs – Roofs and podiums with controlled temporary water attenuation*.

A.3 Recommendations for the design of green roofs 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*.

A.4 Additional guidance for inverted roof specifications is given in BBA Information Bulletin No 4 *Inverted roofs – Drainage and U value corrections*. InstallationA.5 Installation of Protec must be carried out in accordance with the relevant clauses of Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls*.

A.5 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 636 : 2012 + A1 : 2015 *Plywood — Specifications*
- BS EN 1928 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of watertightness*
- 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 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 15813 : 2011 *Polymer modified bituminous thick coatings for waterproofing — Determination of flexibility at low temperatures*
- BS EN 29073-3 : 1992 *Methods of tests for nonwovens — Methods of test for nonwovens — Determination of tensile strength and elongation*
- EN 13707 : 2013 *Flexible sheets for waterproofing — Reinforced bitumen sheets for roof waterproofing — Definitions and characteristics*
- EOTA TR-006 : 2004 *Determination of the resistance to dynamic indentation*
- EOTA TR-007 : 2004 *Determination of the resistance to static indentation*
- EOTA TR-008 : 2004 *Determination of the resistance to fatigue movement*
- ISO 9001 : 2015 *Quality management systems — Requirements*

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- relates only to the product that is named and described on the front page
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- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
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