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Agrément Certificate
10/4745
Product Sheet 2

DUOFLEX STRUCTURAL WATERPROOFING

DUOFLEX WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet(1) relates to the Duoflex Waterproofing System, for use in forming a waterproof sandwich membrane on new or existing horizontal surfaces in above-ground and basement constructions, or to form a damp-proof membrane (dpm) on solid floors.

(1) Hereinafter referred to as '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

Resistance to water and water vapour — the system will provide an effective barrier to the passage water under hydrostatic pressure and water vapour from the ground (see section 6).

Resistance to mechanical damage — the system will accept, without damage, the limited foot traffic and loads associated with installation and maintenance, and the effects of thermal or other minor movement likely to occur in practice (see section 7).

Durability — under normal service conditions, the system, when fully protected, will provide an effective barrier to the transmission of moisture for the life of the structure in which it is incorporated (see section 9).

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

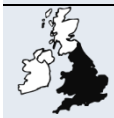
Date of Fourth issue: 6 September 2022

Originally certificated on 8 April 2010

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, the Duoflex Waterproofing System, 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:	**C2(b)**	**Resistance to moisture**
Comment:		The system will enable a structure to satisfy this Requirement. See section 6.1 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The system is acceptable. See section 9 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)**	**Durability, workmanship and fitness of materials**
Comment:		The use of the system satisfies the requirements this Regulation. See section 9 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	3.4	Moisture from the ground
Comment:		The system will enable a structure to satisfy the requirements of this Standard, with reference to clauses 3.4.2(1)(2) and 3.4.7(1)(2). See section 6.1 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The system 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 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(a)(b)(i)**	**Fitness of materials and workmanship**
Comment:		The system is acceptable. See section 9 and the *Installation* part of this Certificate.
Regulation:	**28(a)**	**Resistance to moisture and weather**
Comment:		The system will enable a structure to satisfy the requirements of this Regulation. See section 6.1 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* (3.1, 3.3 and 3.4) of this Certificate.

Additional Information

NHBC Standards 2022

In the opinion of the BBA, the Duoflex Waterproofing System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 5 *Substructure and ground floors*, 5.1 *Substructure and ground bearing floors* Clause 5.1.20 *Damp-proofing concrete floors,* and 5.4 *Waterproofing of basements and other below ground structures*.

Where Grade 3 protection is required and the below ground wall retains more than 600 mm measured from the top of the retained ground to the lowest finished floor level, the system must be used in combination with either a Type B or C waterproofing protection, as defined in BS 8102 : 2022. The Certificate holder should be consulted for approved Type B and C solutions.

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 Standards for Conversions and Renovations*, taking account of other relevant guidance within the chapter and the suitability of the substrate to receive the system.

Technical Specification

1 Description

1.1 The Duoflex Waterproofing System is applied in two layers to provide a waterproofing layer with a minimum coating thickness of 6 mm. The system comprises:

- Elastocol 500 Primer — for priming substrates
- Duoflex Monolithic Membrane — a hot-applied, SBS-modified bitumen membrane
- Soprema TR200 — a 50 g·m^{-2} spunbonded polyester for reinforcing the system
- Soprema Protection layers — a range of protection layers including:
  — Sopralene Flam 180 TF — SBS-modified bitumen membrane with a polyester reinforcement. The upper surface is finished with sand and the lower surface is protected by thermofusible film
  — Sopralene Flam 180 TT — SBS-modified bitumen membrane with a polyester reinforcement. Both sides are finished with sand
  — Sopralene Flam 180 AF — SBS-modified bitumen membrane with a polyester reinforcement. The upper surface is finished with slate. The selvedge is protected by polypropylene film and the lower surface by thermofusible film
  — Sopralene Flam 250 TF — SBS-modified bitumen membrane with a polyester reinforcement. The upper surface is finished with sand and the lower surface is protected by thermofusible film
  — Sopralene Flam 250 AF — SBS-modified bitumen membrane with a polyester reinforcement. The upper surface is finished with slate. The selvedge is protected by polypropylene film and the lower surface by thermofusible film
  — Sopralene Flam Garden 250 AF — SBS-modified bitumen membrane, including an anti-root additive, with a polyester reinforcement, for use in green roof and roof garden specifications
  — Sopralene Flam Garden 250 AT — SBS-modified bitumen membrane, including an anti-root additive, with a polyester reinforcement, for use in green roof and roof garden specifications. The upper surface is finished with slate and the lower surface is finished with sand
  — Elastophene 180-25 — SBS elastomeric bitumen membrane with a non-woven polyester reinforcement. Both sides are protected by thermofusible film.

1.2 The nominal characteristics of the reinforcement and the protection layers are given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Soprema TR200	Sopralene Flam 180 TF and Sopralene Flam 250 TF	Sopralene Flam 180 TT	Sopralene Flam 180 AF and Sopralene Flam 250 AF	Elastophene 180-25	Sopralene Flam Garden 250 AF	Sopralene Flam Garden 250 AT
Roll width (m)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Roll length (m)	200	8	10	8	10	8	8
Roll weight (kg)	10	40	30	46	32	45	47

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

- Soprema Reinforcement Strip — a polyester-reinforced, polymer-modified bitumen sheet used to reinforce movement areas or at the interface of different materials
- Soprema Self-Adhesive Joint Sealant — an aluminium lined, SBS-modified bitumen, self-adhesive sheet used to provide additional joint reinforcement and prevent ingress of the Duoflex membrane component when necessary
- Soprajoint — a flexible SBS elastomeric bitumen waterproofing strip, for use in expansion joints.

2 Manufacture

2.1 Duoflex Monolithic membrane is manufactured by heating and blending bitumen and other components in a temperature-controlled cycle. After blending, the mix is held in a temperature-controlled tank until it is packaged.

2.2 The protection layers are manufactured by saturating the reinforcement and coating with SBS-modified bitumen. The finished products are surfaced with thermofusible polyethylene film, sand or slate as appropriate, and the sheets are cooled, trimmed and reeled.

2.3 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.

2.4 The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by SGS (Certificate FR18/81842815).

3 Delivery and site handling

3.1 Duoflex Monolithic membrane is delivered to site in 20 kg blocks, packed in boxes, on a pallet and shrink-wrapped in plastic. The boxes and the pallets bear the product name, and the boxes also bear the date of packaging.

3.2 The reinforcement and protection layers are packaged with labels bearing the product trade name, and should be stored under cover and kept dry.

3.3 Elastocol 500 Primer is delivered to site in 5 or 30 litre cans.

3.4 The Certificate holder has taken the responsibility of classifying and labelling the system 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 the Duoflex Waterproofing System.

Design Considerations

4 Use

4.1 The Duoflex Waterproofing System is satisfactory for use as a sandwich membrane, for above- and below-ground waterproofing within a structure of concrete, brickwork, blockwork or masonry, or as a dpm for solid floors in accordance with the relevant requirements of CP 102 : 1973 Section 3, and as a fully bonded Type A waterproofing protection as defined in BS 8102 : 2022 for the waterproofing of new or existing structures where Grades 1 – 3 waterproofing protection is required, as defined in Table 2 of that Standard.

4.2 Where Grade 3 waterproofing protection is required, the environment must also be controlled by use of ventilation, dehumidification and/or air conditioning, as appropriate, to ensure that dampness does not occur.

4.3 The membrane is compatible with the substrate and is resistant to those chemicals likely to occur in normal practice.

4.4 Where contact with materials used as a damp-proof course is likely, consideration must be given to the thermal stability of that material, owing to the high temperature reached during installation.

4.5 Detailing requirements, eg at service penetrations, movement joints, must be evaluated on a case-by-case basis. The Certificate holder has standard details or can advise of suitable details for a particular application.

5 Practicability of installation

The system should be installed by trained and approved contractors using specialist equipment. Details of these are available from the Certificate holder.

6 Weathertightness

The system will adequately resist the passage of moisture to the inside of a building and so satisfy the relevant requirements of the national Building Regulations.

7 Resistance to mechanical damage

7.1 The system can accept the limited foot traffic and light loads associated with the installation without damage.

7.2 The system can be damaged by sharp objects and care must be taken with exposed surfaces during construction and back filling operations.

7.3 Where damage does occur, the system must be repaired before enclosure in the structure (see section 12).

7.4 The system is capable of accepting minor structural movement while remaining watertight.

8 Maintenance

As the system is confined within the structure and has suitable durability (see section 9), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 12).

9 Durability

Under normal service conditions, the system, when fully protected will provide an effective barrier to the transmission of moisture for the life of the structure in which it is incorporated.

Installation

10 General

10.1 The Duoflex Waterproofing System must be installed in accordance with the relevant requirements of BS 8000-4 : 1989, BS 8102 : 2009, CP 102 : 1973, the Certificate holder's instructions and this Certificate.

10.2 Concrete or screeded surfaces should have a smooth finish, free from loosely adhering material and sharp protrusions. Concrete should be dry and dust free. Surfaces must be conditioned with Elastocol 500 Primer and allowed to dry, before application of the membrane.

10.3 Vertical surfaces of brickwork, blockwork and, if necessary, masonry, should be rendered to provide an even surface. Brickwork or blockwork not rendered must be flush pointed to give a smooth surface without sudden changes in level.

10.4 To assess the suitability of a substrate to receive the membrane, bond tests must be carried out. If bonding problems occur, advice should be sought from the Certificate holder.

11 Procedure

11.1 The Duoflex Monolithic Membrane compound is heated in a thermostatically controlled bitumen boiler. The nominal temperature range for the molten membrane is 160 to 180°C. The temperature of the melt must never exceed 210°C.

11.2 The molten membrane is discharged from the boiler into a suitable container and applied to the substrate using long-handled rubber squeegees for horizontal surfaces and a suitable spreader for vertical surfaces.

11.3 At expansion joints up to 30 mm wide with less than 50% movement, Soprajoint should be installed as per the Certificate holder's instructions. For structural movement joints greater than 30 mm and 50% movement, the Certificate holder's advice should be sought regarding suitable products, the performance of which is outside the scope of this Certificate.

11.4 The first layer of the molten membrane is applied at a rate of 3 $kg \cdot m^{-2}$.

11.5 Soprema TR200 reinforcement should be embedded by lightly brushing it into the first layer of the membrane whilst it is still warm and tacky. The reinforcement overlaps should be at least 75 mm wide.

11.6 The second layer of membrane is applied over the top of the Soprema TR200 at a rate of 3 $kg \cdot m^{-2}$.

11.7 Once the membrane has been applied, the appropriate protective membrane is installed whilst the second layer of the membrane is still hot, in accordance with the Certificate holder's instructions, prior to applying any insulation and ballast defined by the specification.

11.8 When used for internal tanking, the membrane should be loaded against back pressure in accordance with BS 8102 : 2022.

12 Repair

Any damage to the system must be repaired as soon as possible and before the application of the floor or surface protection. The system may be repaired by removing the damaged area and reinstating the system to the original specification. The advice of the Certificate holder should be sought.

Technical Investigations

13 Tests

13.1 Tests were conducted on samples of the system and the results assessed to determine:

- watertightness
- water vapour transmission rate
- water vapour resistance
- dynamic indentation.
- static indentation
- resistance to fatigue.

13.2 Tests were conducted on samples of the compound and the results assessed to determine:

- fines content
- penetration (aged, unaged and prolonged heating)
- flow (aged, re-melted and prolonged heating)
- low temperature flexibility (unaged, heat aged and water exposure).

13.3 Tests were conducted on samples of the reinforcement and the results assessed to determine:

- thickness
- mass per unit area
- tensile strength.

13.4 Tests were conducted on samples of the protection layer and the results assessed to determine:

- thickness
- tensile strength.

14 Investigations

14.1 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.

14.2 Visits were made to sites to assess the practicability of installation.

Bibliography

BS 8102 : 2022 *Protection of below ground structures against water ingress – code of practice*

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

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

15 Conditions

15.1 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.

15.2 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.

15.3 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.

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

15.5 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.

15.6 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.