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Agrément Certificate

21/5956

Product Sheet 1

LANGLEY LIQUID APPLIED ROOF WATERPROOFING SYSTEMS

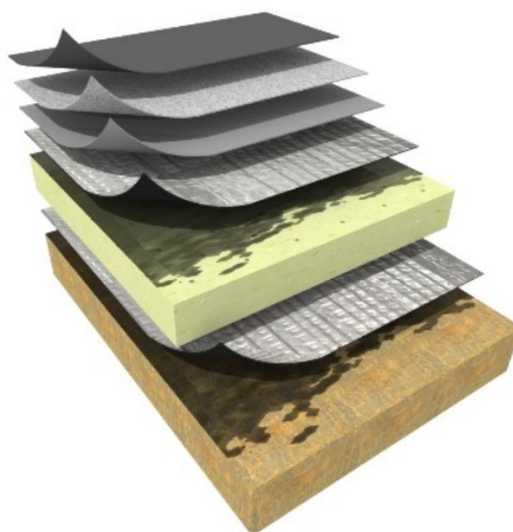
PARACOAT 20 ROOF WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Paracoat 20 Liquid Applied Roof Waterproofing System, for use as a roof waterproofing on new and existing flat and pitched roofs with limited access.

(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

Weathertightness — the system will resist the passage of moisture to the interior of a building (see section 6).

Properties in relation to fire — the system may enable a roof to be unrestricted under the national Building Regulations (see section 7).

Adhesion — the adhesion of the system is sufficient to resist the effects of any likely wind suction and the effects of thermal or other minor movement likely to occur in practice (see section 8).

Resistance to mechanical damage — the system will accept, without damage, the limited foot traffic and loads associated with installation and maintenance (see section 9).

Durability — under normal service conditions, the system will provide a durable waterproof covering with a service life in excess of 20 years (see section 11).

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 First issue: 19 November 2021

Hardy Giesler
Chief Executive Officer

The BBA is a UKAS accredited certification body – Number 113.

The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerfs.co.uk

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

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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Regulations

In the opinion of the BBA, the Paracoat 20 Liquid Applied Roof 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:	B4(1)	External fire spread
Comment:		The system, in some circumstances, is restricted by this Requirement. See section 7.3 of this Certificate.
Requirement:	B4(2)	External fire spread
Comment:		On a suitable substructure, the system can enable a roof to be unrestricted under this Requirement. See sections 7.1 and 7.2 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The system will enable a roof to satisfy this Requirement. See section 6 of this Certificate.
Regulation:	7(1)	Materials and workmanship
Comment:		The system is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The use of the system satisfies the requirements of this Regulation. See sections 10.1 and 11 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	2.6	Spread to neighbouring buildings
Comment:		The system is restricted in some cases by this Standard, under clause 2.6.4 ⁽¹⁾⁽²⁾ . See section 7.4 of this Certificate.
Standard:	2.8	Spread from neighbouring buildings
Comment:		The system, when applied to a suitable structure, can be regarded as having low vulnerability under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 7.1 and 7.2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The use of the system will enable a roof to satisfy the requirements of this Standard with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 6 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)	Fitness of materials and workmanship
Comment:	(b)(i)	The system is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The system will enable a roof to satisfy the requirements of this Regulation. See section 6 of this Certificate.
Regulation:	36(b)	External fire spread
Comment:		On suitable substructures, the use of the system can enable a roof to be unrestricted under this Regulation. See sections 7.1 and 7.2 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 section: *3 Delivery and site handling* of this Certificate.

Additional Information

NHBC Standards 2021

In the opinion of the BBA, the Paracoat 20 Liquid Applied Roof 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, Chapter 7.1 Flat roofs terraces and balconies*.

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

Technical Specification

1 Description

1.1 The Paracoat 20 Liquid Applied Roof Waterproofing System consists of:

- Embedment Coat — a single part (moisture triggered) polyurethane for use as base coat
- Top Coat — a single part (moisture triggered) polyurethane
- 225 g·m⁻² glass fibre mat — system reinforcement
- Langley PU Primer — a one-part primer, for preparing exposed bitumen roofing membranes and porous asphalt, cementitious and timber substrates where required
- Langley PVC Primer — a one-part primer, for preparing PVC single-ply membranes prior to application of the embedment coat
- Langley Epoxy Primer — a two-part primer for preparing metal substrates
- Langley Reactivation Primer — for preparing Langley Embedment coat left for more than five days and aged areas under repair prior to the application of new coats.

1.2 Table 1 gives the physical characteristics of the liquid components of the system.

Table 1 Physical characteristics

Physical characteristics	Embedment coat	Top coat	Langley PU primer	Langley PVC primer	Langley epoxy primer	Langley Reactivation primer
Colour	light grey/red	dark grey	brown	clear	beige	clear
Cure/drying time dependent on temperature	6 to 12 hours	6 to 12 hours	60 to 120 minutes	20 to 60 minutes	2 to 4 hours	4 hours approximately

1.3 A proprietary carrier membrane is used over substrates with joints, such as insulation boards or plywood decking, and beneath the system. The Certificate holder's Technical Services department should be contacted for further advice.

1.4 Ancillary items used with the system, but outside the scope of this Certificate, include:

- Expansion joint membrane
- SBS reinforced bitumen membrane
- SBS elastomeric adhesive panel joint membrane
- Metal Hard Edge
- Lightning Conductor Pads
- Parapet and refurbishment outlets
- GRP roof edge trim
- Refurbishment pipe sleeve for soil/vent pipes, not for use with flues
- Hard wearing protective concrete tile
- Paving support pads/adjustable paving support pad
- Carrier and AVCL membrane
- PIR and Mineral wool Insulation

2 Manufacture

2.1 The liquid components of the system are manufactured by a batch-blending process.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015.

3 Delivery and site handling

3.1 The liquid components packaging bear the component's name, batch number, Health and Safety data, and the BBA logo incorporating the number of this Certificate. Table 2 gives the packaging types and sizes.

Table 2 Packaging and storage

System component	Packaging type	Size	Storage temperature (C°)	Shelf-life (months)
Langley embedment coat	Cans	15 litres	5 - 25	12
Langley Top Coat	Cans	15 litres	5 - 25	12
Langley PVC Primer	Cans	5 and 25 litres	5 - 25	12
Langley PU Primer	Cans	5 and 25 litres	5 - 25	6
Langley Epoxy Primer (Part A and Part B)	Kits	4 litres	5 - 25	12
Langley Reactivation Primer	Cans	5 and 25 litres	5 - 25	6

3.2 The liquid components should be stored in a dry, shaded area and away from ignition sources. The shelf-lives given in Table 2 are for the storage temperature range as quoted, at higher temperatures the shelf-life will reduce progressively.

3.3 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 Paracoat 20 Liquid Applied Roof Waterproofing System.

Design Considerations

4 General

4.1 The Paracoat 20 Liquid Applied Roof Waterproofing System is satisfactory for use on flat and pitched roofs with limited access on:

- concrete
- asphalt
- bituminous roofing membranes, including mineral surfaced
- steel
- PVC membranes
- existing polyurethane coatings
- plywood in conjunction with a specified carrier membrane
- polyisocyanurate (PIR) foam insulation boards in conjunction with a specified carrier membrane
- mineral wool insulation boards in conjunction with a specified carrier membrane.

4.2 Decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018 and, where appropriate, *NHBC Standards 2021*, Chapter 7.1.

4.3 Limited access roofs are defined for the purpose of this Certificate as those subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters, etc, where traffic in excess of this is envisaged, special precautions, such as additional protection, must be taken.

4.4 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of 1:80. When designing flat roofs, twice the minimum finished fall should be assumed unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls, etc.

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

4.6 Insulation materials to be used in conjunction with the system must be in accordance with the Certificate holder's instructions and must be either:

- as described in the relevant clauses of BS 6229 : 2018, or

- the subject of a current BBA Certificate and used in accordance with the scope of that Certificate.

4.7 The NHBC requires that the roof membranes, once installed, are inspected in accordance with *NHBC Standards 2021*, Chapter 7.1, Clause 7.1.12, and undergo an appropriate integrity test, where required. Any damage to the membrane must be repaired in accordance with section 15 of this Certificate and reinspected.

5 Practicability of installation

Installation of the system must be carried out only by specialist roofing contractors trained and approved by the Certificate holder.

6 Weathertightness



The system will adequately resist the passage of moisture to the interior of a building and so satisfies the requirements of the national Building Regulations.

7 Properties in relation to fire



7.1 When classified in accordance with BS EN 13501-5 : 2016 the following systems achieved a B_{ROOF}(t4) classification and so are unrestricted with respect to proximity to a boundary by the documents supporting the national Building Regulations:

System (Testing orientation)	Substrate	Primer + AVCL	Insulation Layer(s)	Primer + Carrier Membrane	Basecoats and Reinforcement	Topcoat
System 1 (F)	An 18 mm thick orientated strand board (OSB) substrate	N/A	N/A	A 1.5 mm thick self-adhesive Carrier Membrane (no primer)	A layer of Embedment Coat applied at 1.0ℓ·m ⁻² (1.5kg·m ⁻²) with 225 g·m ⁻² glass fibre mat embedded	Top Coat applied at 1.0ℓ·m ⁻² (1.5kg·m ⁻²)
System 2 (F)		A 1.5 mm thick self-adhesive AVCL (no primer)	60mm PIR			
System 3 (F)			240mm PIR			
System 4 (S)		N/A	N/A	A 0.4 mm thick self-adhesive Carrier Membrane (no primer)		
System 5 (S)		A 0.4 mm thick self-adhesive AVCL (no primer)	60mm PIR			
System 6 (S)			240mm PIR			
System 7 (S)		N/A	N/A	Spray applied Primer with a 0.6 mm thick self-adhesive Carrier Membrane		
System 8 (F)		Spray applied Primer with a 0.6 mm thick self-adhesive AVCL	25mm PIR			
System 9 (F)			30mm MW			
System 10 (F)			550mm PIR			
System 11 (F)			565mm MW			



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



7.3 In England and Wales the system, when used in pitches of greater than 70°, excluding upstands, should not be used on buildings that have a storey at least 18 m above ground level and contain: one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house), student accommodation, care homes, sheltered housing, hospitals or dormitories in boarding schools.



7.4 In Scotland the system, when used in pitches of greater than 70°, excluding upstands, should not be used on buildings that have a storey at least 11 m above ground level.

8 Adhesion

The adhesion of the system to the substrates and finishes indicated in section 4.1 is sufficient to resist the effects of any wind suction, elevated temperatures, thermal shock or minor movement likely to occur in practice.

9 Resistance to mechanical damage

9.1 The system can accept, without damage, the limited foot traffic and light concentrated loads associated with installation and maintenance. However, reasonable care should be taken to avoid puncture by sharp objects or concentrated loads.

9.2 The system can achieve a result of I3 with respect to dynamic indentation and L3 with respect to static indentation when tested in accordance with EOTA TR006 and EOTA TR007, respectively.

9.3 The system is capable of accepting minor structural movement while remaining weathertight.

10 Maintenance



10.1 The system should be the subject of six monthly inspections and maintenance in accordance with the recommendations in BS 6229 : 2018, Chapter 7, to ensure continued satisfactory performance.

10.2 Any damage should be repaired in accordance with section 15 of this Certificate and the Certificate holder's instructions.

11 Durability



Under normal service conditions, the system will provide a durable waterproof covering with a service life in excess of 20 years.

Installation

12 General

12.1 Installation of the Paracoat 20 Liquid Applied Roof Waterproofing System must be carried out only by specialist roofing contractors trained and approved by the Certificate holder, in accordance with the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989, Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls*, the Certificate holder's instructions and this Certificate.

12.2 All of the system components must be applied when the air and substrate temperatures are greater than 5°C. Special precautions may be necessary when temperatures exceed 30°C, advice can be obtained from the Certificate holder.

12.3 Detailing (eg upstands) is carried out in accordance with the Certificate holder's instructions.

13 Site and surface preparation

13.1 Substrates on which the system is to be applied must be properly prepared in accordance with the Certificate holder's instructions.

13.2 Adhesion to substrates will depend on the condition and cleanness of the substrate. Substrates must be visibly dry, sound and free from loose materials or contamination (eg moss or algae).

13.3 The surface must be prepared to remove loose or flaking materials, and the substrate must be visibly dry before application of the system.

13.4 Damaged areas of the substrate (eg blistered membrane) must be removed, replaced or repaired. Substrate defects (eg shallow-bottomed cracks and indentations) are filled in accordance with the Certificate holder's instructions.

13.5 Deck surfaces must be free from sharp projections such as concrete nibs.

13.6 Gutters and outlets must be checked to ensure that they are, and remain, clear of all debris.

13.7 All points of potential weakness such as splits, cracks, joints and crazed surfaces must be additionally reinforced in accordance with the Certificate holder's instructions prior to application of the main system.

13.8 Most substrates require priming prior to the application of the system. The Certificate holder recommends peel-strength adhesion tests are carried out on-site, prior to application, in order to ensure sufficient adhesion can be achieved and to determine priming requirements.

13.9 The primers can be applied by brush or roller. Certain non-ferrous metals may also require special treatment and the advice of the Certificate holder should be sought in these cases. Primer coverage rates are given in Table 4:

Table 4 Primer application rates

Primer	Application rate ($\text{m}^2 \cdot \ell^{-1}$)
Langley PU Primer	16 – 20
Langley Epoxy Primer	10 – 20
Langley PVC Primer	5 – 8
Langley Reactivation Primer	8 – 10

14 Procedure

14.1 Application can be by brush or roller. Brush application is normally used only for small roof areas and for embedding the fibre mat reinforcement into the waterproofing at areas of detailing.

14.2 Work should only commence on an area if it can be carried out to the full thickness for that particular coat, before weather changes occur. Where weather interrupts installation between layers, installation can proceed up to five days, provided the surface is clean, without the need for Langley Reactivation Primer.

14.3 The system is applied at the coverage rate for a smooth texture substrate given in Table 5. The advice of the Certificate holder on coverage rates for intermediate, rough, porous and undulating substrates must be sought. The $225 \text{ g} \cdot \text{m}^{-2}$ glass fibre mat is embedded in the Langley Embedment Coat while the membrane is still wet, ensuring a minimum overlap of 50 mm at all laps of the reinforcement.

Table 5 System coverage rates and finished thickness

Layer (unit)	Full reinforcement system
Langley Embedment Coat ($\text{l} \cdot \text{m}^{-2}$)	1.0
Reinforcement	$225 \text{ g} \cdot \text{m}^{-2}$ reinforcement
Langley Top Coat ($\text{l} \cdot \text{m}^{-2}$)	1.0

14.4 The embedment coat is left to cure prior to the application of the Langley Top Coat at the coverage rate given in Table 5 and left to cure before any trafficking of the surface is allowed.

14.5 Random tests are carried out on the finished coating surface by cutting out small areas to measure finished cured thickness. Test areas must be repaired after the sample is taken.

15 Repair

The repair of minor damage to the system can be achieved effectively by cleaning back to the unweathered material with clean water or dilute detergent solution, allowing to dry, reactivating using Langley Reactivation Primer if over five days old, and recoating the damaged area with the membrane at the recommended coverage rates given in section 14.3.

Technical Investigations

16 Tests

Tests were carried out and the results assessed to determine:

- water vapour transmission
- resistance to water penetration
- tensile strength and elongation
- tensile bond strength
- static indentation
- dynamic indentation
- resistance to fatigue movement
- UV ageing for 20 year equivalent, followed by tensile strength and dynamic indentation
- heat ageing for 20 year equivalent, followed by tensile strength, dynamic indentation and fatigue cycling
- water exposure for 20 year equivalent, followed by tensile bond strength and static indentation.

17 Investigations

17.1 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.

17.2 Data on fire performance were evaluated.

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

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

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

EOTA TR 006 *Determination of the resistance to dynamic indentation*

EOTA TR 007 *Determination of the resistance to static indentation*

18 Conditions

18.1 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.

18.2 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.

18.3 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.

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

18.5 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.

18.6 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.