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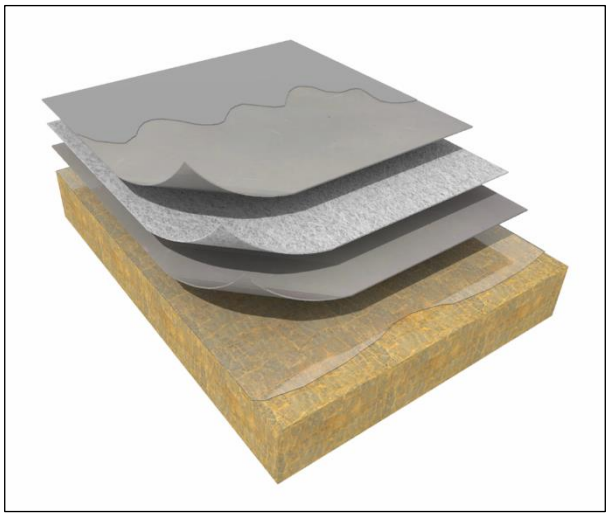
Agrément Certificate
19/5654
Product Sheet 1

LANGLEY LIQUID-APPLIED (WET ON WET) WATERPROOFING SYSTEMS

PARACOAT COLD POLYUREA

This Agrément Certificate Product Sheet[1] relates to Paracoat Cold Polyurea, based on a liquid-applied polyurea membrane for use as a waterproofing layer on new or existing flat or pitched roofs with limited access and for waterproofing balconies, terraces and podiums.

(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 systems will resist the passage of moisture into a building (see section 6).

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

Adhesion — the systems will resist the effects of any likely wind suction acting on the roof (see section 8).

Resistance to mechanical damage — the systems will accept the limited foot traffic and loads associated with installation and maintenance (see section 9).

Durability — under normal service conditions, the systems will provide a durable roof waterproofing with a service life in excess of 25 years (see section 11).

The BBA has awarded this Certificate to the company named above for the systems described herein. These systems have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

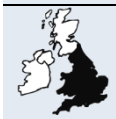
Date of First issue: 10 June 2019

John Albon
Chief Scientific Officer

Claire Curtis-Thomas
Chief Executive

Regulations

In the opinion of the BBA, Paracoat Cold Polyurea, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	**B4(2)**	**External fire spread**
Comment:		On a suitable substructure, the systems can enable a roof to be unrestricted under this Requirement. See section 7 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The systems will enable a roof to satisfy this Requirement. See section 6.1 of this Certificate.
Regulation:	**7**	**Materials and workmanship (applicable to Wales only)**
Regulation:	**7(1)**	**Materials and workmanship (applicable to England only)**
Comment:		The systems are acceptable. See section 11 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)(2)**	**Durability, workmanship and fitness of materials**
Comment:		The use of the systems satisfies the requirements of this Regulation. See sections 10.1 and 11 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	2.8	Spread from neighbouring buildings
Comment:		The systems, when applied to a suitable substructure, can be regarded as having a low vulnerability and will enable a roof to be unrestricted under this Standard, with reference to clause 2.8.1[(1)(2)]. See section 7 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The systems 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 6.1 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The systems can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		Comments in relation to the systems under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1[(1)(2)] and Schedule 6[(1)(2)].

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	**23(a)(i)**	**Fitness of materials and workmanship**
Comment:	**(iii)(b)(i)**	The systems are acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The systems will enable a roof to satisfy the requirements of this Regulation. See section 6.1 of this Certificate.

Regulation:	**36(b)**	**External fire spread**
Comment:		On suitable substructures, the use of the systems can enable a roof to be unrestricted under the requirements of this Regulation. See section 7 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 2019

In the opinion of the BBA, Paracoat Cold Polyurea, 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 7.1 *Flat Roofs and balconies*.

Technical Specification

1 Description

1.1 Paracoat Cold Polyurea systems are built up by applying the following components on site:

- Paracoat Cold Polyurea — a two-component, polyurea, liquid-applied waterproofing membrane
- Paracoat Cold Polyurea ST (<2%) — a two-component thixotropic version of Paracoat Cold Polyurea for use on sloped surfaces
- Reinforcement Fabric 80 — a 80 $g \cdot m^{-2}$ polyester reinforcement fabric for embedding into Paracoat Cold Polyurea over existing cracks, at upstands and other changes of plane in the Paracoat Cold Polyurea unreinforced system
- Paracoat Cold Polyurea Reinforcement Fleece — a 150 $g \cdot m^{-2}$ glass fibre mat, for use in the Paracoat Cold Polyurea fully reinforced system
- Paracoat Humidity Primer — a two-component water based primer for use on concrete surfaces where the moisture content of the concrete is greater than 4%
- Paracoat Cold Polyurea PU Primer — a primer for use when overlapping onto existing coating during repairs
- Paracoat Polyurea Thixo Additive — an additive for mixing into Paracoat Cold Polyurea when used at upstands and on steep slopes.

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

- Paracoat Solvent — a general-purpose cleaning solvent and diluent viscosity modifier. When blended at a maximum addition rate of 10% with Paracoat Cold Polyurea, the mixture may be used as a sealer/primer on dry porous substrates
- Specialist primers/porosity sealers — for use on various substrates
- Paracoat Colodur (pigmented) — a single-component, firm, flexible, UV-resistant decorative and protective aliphatic polyurethane coating for application over Paracoat Cold Polyurea
- Paracoat Fast 2K/SF — a two-component, solvent-free, UV resistant, fast curing, decorative and protective coating for application over Paracoat Cold Polyurea waterproofing membrane
- Coarse antislip additive — a nominal 700 µm powder that is mixed with the protective coating to obtain an anti-slip finish
- Proprietary joint tape — a self-adhesive flexible tape for use over existing cracks, at upstands, over joints and at changes of plane in unreinforced specifications
- Proprietary sealants.

The Certificate holder should be consulted for suitable products.

2 Manufacture

2.1 The systems components 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.

3 Delivery and site handling

3.1 The liquid components of the systems are delivered to site in sealed containers with labels bearing the Certificate holder's name, product description and the appropriate hazard and risk labels (see section 3.3). They have a storage life of 12 months and are available in the pack sizes detailed in Table 1.

Table 1 Pack sizes

Component	Pack sizes (kg)
Paracoat Cold Polyurea (Part A)	25
Paracoat Cold Polyurea (Part B)	1.5
Paracoat Humidity Primer (Parts A + B)	5 and 18
Paracoat Polyurea Thixo Additive	1
Reinforcement Fabric 80 (0.3 x 100 m)	2.4
Reinforcement Fabric 80 (1.0 x 150 m)	8
Paracoat Cold Polyurea Reinforcement Fleece (1.0 x 150 m)	12

3.2 All containers must be stored under cover in a cool, dry, ventilated location away from other chemicals and any source of ignition. Storage temperatures should be between 10 and 30°C with all materials protected from sub-zero temperatures and direct sunlight. Each container carries a label bearing the manufacturer's name, product name and health and safety information. Rolls of reinforcement fabric should be stored flat in a dry, clean environment and protected from moisture. The Certificate holder's product data sheets should be consulted for details.

3.3 The Certificate holder has taken the responsibility of classifying and labelling the systems components under the *CLP Regulation (EC) No 1272 / 2008 on the classification, labelling and packaging of substances and mixtures*. Users must refer to the relevant Safety Data Sheet(s).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Paracoat Cold Polyurea.

Design Considerations

4 Use

4.1 Paracoat Cold Polyurea systems are satisfactory for use as a fully adhered, exposed waterproofing layers on new and existing flat and pitched roofs with limited access and, when protected, on pedestrian access roofs, balconies, terraces and podiums.

4.2 Decks to which the systems are to be applied must comply with the relevant requirements of BS 6229 : 2018 and, where appropriate, *NHBC Standards* 2019, Chapter 7.1.

4.3 Flat roofs are defined for the purpose of this Certificate as those having a minimum finished fall of 1:80. For design purposes, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available,

including overall and local deflection and direction of falls, etc. Pitched roofs are defined for the purpose of this Certificate as those having a fall greater than 1:6.

4.4 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, additional protection to the membrane must be provided (see section 13.8).

4.5 Pedestrian access roofs are defined for the purpose of this Certificate as those suitable for foot traffic only, eg terraces, balconies and podium decks. Special precautions must be taken to protect the membrane when used in these areas (see section 13.8).

4.6 The adhesion of the systems has been assessed as suitable on concrete, including damp concrete(1), substrates. Acceptable adhesion of the systems to other substrates should be confirmed by test.

(1) Concrete with a humidity level ≥4% must be primed with Paracoat Humidity Primer.

5 Practicability of installation

Installation of the systems must only be carried out by installers who have been trained and approved by the Certificate holder.

6 Weathertightness

6.1 The systems will adequately resist the passage of moisture into the building and will enable a roof to comply with the requirements of the national Building Regulations.

6.2 The systems are impervious to water and will achieve a weathertight roof capable of accepting minor structural movement.

7 Properties in relation to fire

7.1 When tested to CEN/TS 1187 : 2012 and classified in accordance with BS EN 13501-5 : 2016, a flat roof system comprising a 18 mm WBP plywood substrate and two coats of Paracoat Cold Polyurea (beige colour), each applied at a coverage rate of 1 kg·m^{-2} is designated B_{ROOF}(t4).

7.2 The designation of other specifications should be confirmed by:

England and Wales — test or assessment in accordance with Approved Document B (Volumes 1 and 2), Appendix A, clause A1
Scotland — test to conform to Mandatory Standard 2.8, clause 2.8.1
Northern Ireland — test or assessment by UKAS-accredited laboratory, or an independent consultant with appropriate experience.

8 Adhesion

The adhesion of the systems to concrete is sufficient to resist the effects of wind suction, thermal cycling or other minor structural movement likely to occur in service. Acceptable adhesion to other substrates should be confirmed by test.

9 Resistance to mechanical damage

9.1 The systems can accept the limited foot traffic and light concentrated loads associated with installation and maintenance. Where traffic in excess of this is envisaged, such as for maintenance of lift equipment, a walkway should be provided, for example, using concrete slabs supported on bearing pads. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads. Performance with regards to resistance to dynamic impact and static indentation are given in Table 2.

Table 2 Dynamic impact and static indentation

Test	Result		Method
	Unreinforced system	Reinforced system[1]	
Dynamic impact			
unaged on hard substrate[2]			
23°C	I_4	I_4	EOTA TR 006
-20°C	I_4	I_4	
heat aged[3] on hard substrate[2] tested at -20°C	I_4	I_4	
UV-A aged[4] on hard substrate[2] tested at -20°C	I_4	I_4	
Static indentation			
unaged on hard substrate[2]			
23°C	L_4	L_4	
60°C	L_4	L_4	
80°C	L_3	L_4	
90°C	L_2	L_3	
unaged on soft substrate[5]			
23°C	L_3	L_3	
60°C	L_1	–	
80°C	L_1	–	EOTA TR 007
90°C	L_1	–	
water exposed[6] on hard substrate[2]			
60°C	L_4	–	
80°C	L_3	–	
90°C	L_2	L_3	

(1) Reinforced with Paracoat Cold Polyurea Reinforcement Fleece.
(2) Steel substrate.
(3) 200 days at 80°C.
(4) UV aged at 60°C for an exposure of 1000 $MJ \cdot m^{-2}$.
(5) PU insulation.
(6) Water exposure at 60°C for 60 days for unreinforced system and 180 days for the reinforced system.

9.2 When used on pedestrian access roofs, the systems must be suitably protected (see section 13.8).

10 Maintenance

10.1 Installations must be the subject of inspections and maintenance to in accordance with BS 6229 : 2018, Chapter 7, to ensure continued performance.

10.2 Maintenance should include checks and operations to ensure that the membrane and drainage outlets are free from the build-up of silt and other debris, and that protection layers, eg walkways, are in good condition.

10.3 In the event of the systems being contaminated by oil, grease or other chemicals, the advice of the Certificate holder must be sought.

10.4 Damage to the systems must be repaired as soon as possible (see section 14).

11 Durability

With adequate maintenance and repair, the systems will have an expected service life in excess of 25 years.

Installation

12 General

12.1 Installation of Paracoat Cold Polyurea must be in accordance with the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989, BS 6229 : 2018, the Certificate holder's instructions and this Certificate.

12.2 Installation should not be carried out during inclement weather, eg rain, fog or snow, and the ambient temperature at the time of laying must be between 5 and 35°C. Surfaces to be coated must be at least 3°C above the dew-point.

12.3 Substrates to which the systems are to be applied must be sound, dry, clean and free from sharp projections such as nail heads and concrete nibs. The Certificate holder's advice should be sought for suitable cleaning procedures and the use of a proprietary surface cleaner/HSE approved fungicidal wash.

12.4 Previously coated areas must be checked for integrity and adequate adhesion to the substrate. Defects such as cracks and blisters must be repaired prior to application of the systems in accordance with the Certificate holder's instructions.

12.5 Defects in the substrate (eg cracks) must be repaired, prior to application, in accordance with the Certificate holder's instructions. Cracks are treated with a reinforced Paracoat coating layer consisting of a 300 mm strip of reinforcement fabric embedded in Paracoat Cold Polyurea prior to the application of the main waterproofing layer.

12.6 Active joints must also be treated with a reinforced Paracoat Cold Polyurea coating layer, prior to the application of the main waterproofing layer, to ensure that the designed movement accommodation is maintained. The Certificate holder's advice should be sought for suitable specifications.

12.7 Substrates must be prepared and primed in accordance with the Certificate holder's instructions. Adhesion checks should be carried out to ensure that the systems are fully compatible with the existing surfaces and to determine the necessity for a primer (see section 4.6).

12.8 The Certificate holder should be consulted on specifications for detailing around drains and other penetrations.

12.9 After use, all equipment must be cleaned with Paracoat Solvent. The Certificate holder's advice can be sought on the use of other cleaning products.

13 Procedure

13.1 Paracoat Cold Polyurea, Parts A and B, are mixed for at least two minutes using a slow-speed drill fitted with a suitable paddle stirrer, taking care to avoid excessive air entrainment and ensuring that any settlement occurring during storage is re-dispersed and the product is homogeneous.

13.2 Cracks and upstands must be treated with a reinforced Paracoat Cold Polyurea coating layer in accordance with the Certificate holder's instructions.

13.3 Where application to upstands or other steep slopes is required, Paracoat Polyurea Thixo Additive is mixed into Paracoat Cold Polyurea at an addition rate of between 1 to 3%.

13.4 Paracoat Cold Polyurea is applied by roller, squeegee or suitable airless spray equipment to achieve a minimum total application rate of 2 $kg \cdot m^{-2}$ and a minimum total coating thickness of 1.6 mm. On sloped surfaces or when application is by airless spray, the required application rate can be achieved by applying the coating in two or more coats.

13.5 For the reinforced system, Paracoat Cold Polyurea Reinforcement Fleece is embedded in the wet base coat. A second coat of Paracoat Cold Polyurea is then applied over the top of the base coat to fully encapsulate the reinforcement.

13.6 Following application, a spiked roller is used to eliminate air bubbles that form in the wet membrane

13.7 A check must be made on the cured membrane for the presence of pinholes and missed areas. These are rectified by applying additional coats of membrane as necessary.

13.8 When used on public access roofs, the fully cured system must be protected, eg with a suitable walkway or paving. The Certificate holder must be consulted for details.

14 Repair

14.1 Damage to systems must be repaired as soon as possible to ensure that the waterproofing integrity is maintained.

14.2 The systems can be repaired by cutting back the damaged or de-bonded coating to sound, well-bonded material and reinstating it to the original specification ensuring an overlap of at least 30 mm onto the existing coating.

14.3 Areas of existing coating to be overlapped must be cleaned, dried and primed with Paracoat Cold Polyurea PU Primer and allowed to fully dry for at least one hour prior to overcoating in accordance with the Certificate holder's instructions.

14.4 If repairs to the substrate are required, the Certificate holder's advice must be sought for suitable repair materials.

14.5 On completion, and when the coating has fully cured, the repair is inspected to ensure it is sound and well bonded to the existing coating.

Technical Investigations

15 Tests

15.1 Tests on Paracoat Cold Polyurea were carried out and the results assessed to determine:

- tensile strength and elongation
- dynamic indentation.

15.2 Additional characterisation tests were carried out on the systems components.

16 Investigations

16.1 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.

16.2 An assessment was made of independent test data relating to the systems.

16.3 Data relating to the external roof fire performance were evaluated.

Bibliography

BS 6229 : 2018 *Flat roofs with continuously supported 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*

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*

17 Conditions

17.1 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.

17.2 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.

17.3 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.

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

17.5 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.

17.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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