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Agrément Certificate

19/5651

Product Sheet 1

WHITE KNIGHT ROOF WATERPROOFING SYSTEMS

WHITE-KNIGHT

This Agrément Certificate Product Sheet⁽¹⁾ relates to White-Knight, a liquid-applied, moisture activated polyurethane for use 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 into the building (see section 6).

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

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

Resistance to mechanical damage — the system, when applied with White-Knight Top Coat, will accept without damage, the limited foot traffic and loads associated with installation and maintenance (see section 9).

Durability — under normal service conditions and when used under protection or in non-accessible areas, the system will provide a durable waterproof covering with a service life of at least 25 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: 7 May 2019

John Albon
Chief Scientific Officer

Claire Curtis-Thomas
Chief Executive

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.bbacerts.co.uk
Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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, White-Knight, 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 suitable substructures, the use of the system can enable a roof to be unrestricted under this Requirement. See section 7 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The system will contribute to satisfying 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 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:		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:	2.8	Spread from neighbouring buildings.
Comment:		The system, when applied to a non-combustible substrate, can be regarded as having low vulnerability under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See section 7 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 6.1 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The system can contribute to meeting the 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:		All 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(a)(b)(i)	Fitness of materials and workmanship
Comment:		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 use of the system 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 system 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, White-Knight, 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 and balconies*.

Technical Specification

1 Description

1.1 White-Knight is a liquid applied roof waterproofing kit which consists of:

- White-Knight — a one-component, polyurethane, liquid-applied waterproofing membrane
- White-Knight Top Coat — a one-component, liquid-applied, aliphatic polyurethane top coat for use over White-Knight.

1.2 Ancillary products used with the system, but outside the scope of this Certificate, are:

- Aqua-Primer — a two-component, water-based epoxy primer for use on concrete substrates
- geotextile reinforcement — a non-woven polyester reinforcement for use in the reinforcement of construction details, flashing joints, cracks and gaps.

2 Manufacture

2.1 The system components are manufactured by blending raw materials.

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 White-Knight component is available in 1, 6, 15, 25 and 200 kg drums. It must be stored in a dry location within a temperature range of 5 to 25°C. The product has a shelf life of a minimum of 12 months.

3.2 White-Knight Top Coat is available in 1, 4 and 20 litre tins. It must be stored in a dry location within a temperature range of 5 to 20°C. The product has a shelf life of a minimum of 12 months.

3.3 The Certificate holder has taken 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 White-Knight.

Design Considerations

4 General

4.1 White-Knight, when used with White-Knight Top Coat, is satisfactory for use as a waterproofing system on new and existing, flat and pitched, limited access roofs. When installed without the top coat, the system is only suitable for non-accessible areas or under protection.

4.2 The system is suitable for use on the following substrates:

- concrete
- mortar
- fibre cement.

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, additional protection to the membrane must be provided, as specified by the Certificate holder.

4.4 Flat roofs are defined for the purpose of this Certificate as those with a minimum finished fall of 1:80. For design purposes, twice the minimum fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls, etc. Pitched roofs are defined for the purpose of this Certificate as those having a fall in excess of 1:6.

4.5 Decks to which the system is to be applied must comply with the relevant requirements of BS 6229 : 2018, BS 8217 : 2005 and, where appropriate, *NHBC Standards* 2019, Chapter 7.1.

5 Practicability of installation

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

6 Weathertightness



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

6.2 The system is impervious to water and, when used in accordance with this Certificate, will give a weathertight roofing capable of accepting minor movement without damage.

7 Properties in relation to fire



7.1 When tested to DD CEN/TS 1187 : 2012, Test 4, and classified in accordance with BS EN 13501-5 : 2016, a system comprising an 8 mm fibre cement board, a base coat of White-Knight and a top coat of White-Knight Top Coat reinforced with geotextile ($134 \text{ g}\cdot\text{m}^{-2}$), achieved a classification of $\text{B}_{\text{ROOF}}(\text{t4})$.

7.2 The designation of other specifications, eg when used on combustible substrates, should be confirmed by:

England and Wales – test or assessment in accordance with Approved Document B, Appendix A, clause 1

Scotland – test to conform to Mandatory Standard 2.8, clause 2.8.1⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland – test or assessment by a UKAS-accredited laboratory, or an independent consultant with appropriate experience.

8 Resistance to wind uplift

The adhesion of the system to the substrates indicated in section 4.2 is sufficient to resist the effect of any wind suction, elevated temperatures, thermal shock or minor movement likely to occur in service.

9 Resistance to mechanical damage

9.1 The system, when applied with White-Knight Top Coat, can accept without damage the limited foot traffic and light concentrated loads associated with installation, maintenance and pedestrian traffic. However, reasonable care should be taken to avoid puncture by sharp objects or concentrated loads, see table 1.

Table 1 Static and Dynamic Indentation

Test	Result	Method	
<i>Dynamic indentation</i>			
unaged substrates at 23°C			
concrete	I ₃	EOTA TR-006	
steel	I ₃		
unaged substrates at -20°C			
concrete	I ₃		
steel	I ₃		
steel substrates at -20°C			
heat aged ⁽¹⁾	I ₄		
steel substrate at -10°C			
UV aged ⁽²⁾	I ₃		
concrete substrate at -10°C			
UV aged ⁽²⁾	I ₃		
steel substrate at -10°C			
prepared at 0°C	I ₃		
prepared at 40°C	I ₃		
concrete substrate at -10°C			
prepared at 0°C	I ₃		
prepared at 40°C	I ₃		
<i>Static indentation</i>			
unaged substrates at 23°C			
concrete	L ₄	EOTA TR-007	
steel	L ₄		
unaged substrates at 90°C			
concrete	L ₁		
steel	L ₁		
unaged substrates ⁽³⁾ at 80°C			
steel	L ₁		
steel substrate at 90°C			
water exposure ⁽⁴⁾	L ₁		
steel substrate ⁽³⁾ at 90°C			
water exposure ⁽⁵⁾	L ₃		

- (1) Heat aged at 80°C for 200 days.
- (2) UV aged for 5000 hrs for an exposure of 1000 MJ·m⁻².
- (3) Sample prepared with White-Knight Top Coat.
- (4) Water exposure at 60°C for 30 days.
- (5) Water exposure at 60°C for 60 days.

9.2 When applied without the top coat, the system must only be accessed when a suitable protection, such as pavers, is used.

10 Maintenance



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

10.2 Where damage has occurred it should be repaired in accordance with section 15 and the Certificate holder’s instructions.

11 Durability



White-Knight will achieve an initial life expectancy of at least 25 years when used under protection or in non-accessible areas. White-Knight Top Coat may require re-application after 10 years.

12 General

12.1 The system must be applied when the air and substrate temperature are greater than 5°C. The advice of the Certificate holder should be sought where air temperatures exceed 35°C.

12.2 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 applied must be properly prepared in accordance with the Certificate holder's instructions.

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

13.3 The surface must be prepared to remove loose or flaking materials, ideally with a high pressure washer, but the substrate must be visibly dry before the application of the system.

13.4 Damaged areas of the substrate 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 protruding fixing bolts and 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 reinforced with geotextile reinforcement prior to the application of the system.

13.8 Aqua-Primer can be used to prime concrete substrates. The primer should be applied at a rate of 200 g·m⁻². Any ponding water should be removed before application of the primer.

14 Application

14.1 Prior to application, checks must be made to ensure the substrate is dry (ie free from rainwater, surface condensation and frost) and that the prevailing weather and site conditions are correct. The following normal limitations apply:

- application must not take place when the relative humidity is in excess of 95%, or in fog. The temperature/humidity must be such that there is no risk of surface condensation occurring before or during application
- the substrate temperature must be 3°C above the measured dew point
- the primer, where used, must be cured
- the wind speed must be such that it does not interfere with the application and cause overspray.

14.2 Application of White-Knight can be by brush, roller or spray in at least two coats. The first coat is applied at a coverage rate of 0.7 to 0.9 kg·m⁻², the second coat is applied at a rate of 0.8 to 0.9 kg·m⁻². The minimum total consumption is 1.5 to 1.8 kg·m⁻², to give a minimum total thickness of 0.95 to 1 mm.

14.3 The second coat must be applied less than 48 hours after the first application.

14.4 For additional protection for use of the system in accessible roofs up to user load P3, a coat of White-Knight Top Coat should be applied at a coverage rate of 0.2 to 0.4 kg·m⁻² in one to two successive coats over a cured White-Knight surface.

15 Repair

The repair of minor damage to the system can be achieved effectively by cleaning back to unweathered material and recoating the damaged area with the membrane at the application rates stated in section 14.2.

Technical Investigations

16 Tests

16.1 Tests were conducted on the system and the results assessed by the BBA to determine:

- tensile strength and elongation
- water vapour diffusion resistance coefficient (μ)
- watertightness
- tensile bond strength on concrete, ceramic and fibre cement
- dynamic indentation
- static indentation
- resistance to fatigue movement
- resistance to UV ageing, followed by tensile strength and dynamic indentation
- resistance to water exposure, followed by tensile bond strength and static indentation
- resistance to heat ageing, followed by tensile bond strength and static indentation.

16.2 Characterisation tests were conducted on the liquid components as follows:

White-Knight

- density
- dry extract
- ash content
- viscosity

White-Knight Top Coat

- density
- viscosity.

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 the fire performance were evaluated.

Bibliography

BS 6229 : 2018 *Flat roofs with continuously supported flexible waterproof coverings — Code of practice*

BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*

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

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

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.