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**Agrément
Certificate
No 03/4060**

Designated by Government
to issue
European Technical
Approvals

INTEGRITANK LIQUID APPLIED ROOFING

Revêtement d'étanchéité de toiture
Dachabdichtungen

Product



Spray application



Inverted warm roof application

• THIS CERTIFICATE RELATES TO INTEGRITANK LIQUID APPLIED ROOFING, A SYSTEM INCORPORATING A TWO-PART METHYL METHACRYLATE RESIN-BASED WATERPROOF MEMBRANE APPLIED IN TWO COLOUR-CODED COATS.

- The system is for use as:
 - (a) inverted application on flat roofs
 - (b) warm roof application on flat or pitched roofs.
- The system is manufactured and marketed by the Certificate holder and is applied by their authorised contractors.

Regulations

1 The Building Regulations 2000 (as amended) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of roof waterproofing systems with the Building Regulations. In the opinion of the BBA, Integritank Liquid Applied Roofing, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: B4(2)	External fire spread
Comment:	The fire rating designation of roofs on which the system is used is dependent on the protective surface finish used. See section 9 of this Certificate.
Requirement: C4	Resistance to weather and ground moisture
Comment:	Tests for water resistance on the system, including joints, indicate that the system meets this Requirement. See section 8.1 of this Certificate.
Requirement: Regulation 7	Materials and workmanship
Comment:	The system is acceptable. See section 12 of this Certificate.

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2 The Building Standards (Scotland) Regulations 1990 (as amended)



In the opinion of the BBA, Integritank Liquid Applied Roofing, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Technical Standards as listed below.

Regulation:	10	Fitness of materials and workmanship
Standard:	B2.1	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product can contribute to a construction meeting this Standard. See the <i>Installation</i> part of this Certificate.
Standard:	B2.2	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product is an acceptable material. See section 12 of this Certificate.
Regulation:	12	Structural fire precautions
Standard:	D9.1	Fire spread from an adjoining building
Comment:		The fire rating designation of roofs on which the system is used is dependent on the protective surface finish use. See section 9 of this Certificate.
Regulation:	17	Resistance to moisture
Standard:	G3.1	Resistance to precipitation — Resistance to precipitation
Comment:		Tests for water resistance of the system indicate that the use of the system will enable a roof to satisfy the requirements of this Standard. See section 8.1 of this Certificate.

3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, Integritank Liquid Applied Roofing, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 12 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		Tests for water resistance of the system, including joints, indicate that the use of the system will enable a roof to satisfy the requirements of this Regulation. See section 8.1 of this Certificate.
Regulation:	E5	External fire spread
Comment:		The fire rating designation of roofs on which the system is used is dependent on the protective surface finished used. See section 9 of this Certificate.

4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See sections: *6 Delivery and site handling (6.1 and 6.2).*

5 Description

5.1 Integritank Liquid Applied Roofing is a waterproofing system comprising:

- PA1 Primer — a single-component, solvent-based, methyl methacrylate resin solution, for use at temperatures above 5°C
- PAR1 Primer — a single-component, solvent-free, highly-reactive methyl methacrylate resin, for use at temperatures up to 30°C
- Integritank (Spray Grade) Waterproofing — a two-part, solvent-free, methyl methacrylate resin, comprising Part A and Part B
- Integritank (Hand Grade) Waterproofing — a single-component, solvent-free, methyl methacrylate resin, for use in small or inaccessible areas and repair works
- Catalyst — for use in PAR1 Primer, Integritank (Spray Grade) Waterproofing Part B and Integritank (Hand Grade) Waterproofing.

5.2 The components of the system are manufactured by a batch-blending process. A series of quality control checks is conducted on each batch and on the combined components.

6 Delivery and site handling

6.1 The components are delivered as detailed in Table 1. When correctly stored, unopened, the products listed have a shelf-life of at least six months.

Table 1 Weights and packaging

Component	Weight and packaging
PA1 Primer	5 kg, 20 kg and 190 kg supplied in metal containers
PAR1 Primer	5 kg kit 4.85 kg Primer supplied in metal containers 150 g Hardener Powder supplied in plastic bags 20 kg kit 19.4 kg Primer supplied in metal containers 600 g Hardener Powder supplied in plastic bags
Integritank (Hand Grade) Waterproofing	4.5 kg supplied in metal containers 5 kg and 20 kg catalyst

6.2 The components are classified under the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP3) and all containers bear the appropriate hazard warning label(s). Flashpoints and hazard classification are given in Table 2.

Table 2 Flashpoint and hazard classification

Component	Flashpoint (°C)	Classification
PA1	11	Highly flammable and irritant
PAR1	12	Highly flammable and irritant
Spray Grade Part A	16	Highly flammable and irritant
Spray Grade Part B	16	Highly flammable and irritant
Hand grade	16	Highly flammable and irritant

7 General

7.1 Integritank Liquid Applied Roofing is satisfactory for use as a waterproofing layer on:

- inverted applications on flat roofs
- warm roof applications on flat or pitched roofs (protected insulation systems)
- waterproofing layer (tanking specification) on a flat roof with a zero fall slope.

7.2 The system is suitable for use on concrete or metal substrates.

7.3 Limited access roofs are defined for the purposes of this Certificate as those roofs subjected only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc. Where traffic in excess of this is envisaged, a third coat of Integritank membrane to a wet film thickness of 1 mm should be applied into which aggregate overscatter should be broadcast.

7.4 Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 1:80. Pitched roofs are defined as those having falls in excess of 1:6. Completely flat roofs are defined for the purpose of this Certificate as those roofs having a finished fall of less than 1:80.

7.5 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.

7.6 Decks to which the product is to be applied must comply with the relevant requirements of BS 6229 : 2003, BS 8217 : 1994 and, where appropriate, NHBC Standards, Chapter 7.1, or the Zurich Building Guarantees Technical Standards, Section 5, clause 5.9.3.19.

8 Weathertightness

8.1 Test data confirm that the system will adequately resist the passage of moisture to the inside of the building and so meet or comply with the relevant requirements of the national Building Regulations:

England and Wales

Section 5.1 of Approved Document C4

Scotland

Regulation 17, Standard G3.1

Northern Ireland

Regulation C4.

8.2 The product is impervious to water and, when used as described, will give a weathertight roofing capable of accepting minor movement without damage.

9 Properties in relation to fire



When used under a protective surface finish, the fire rating of the roof is dependent on the finish used. The designation of roof should be confirmed by:

England and Wales

Test or assessment in accordance with Approved Document B, Appendix A, Clause A1

Scotland

Test to conform to Standard D9.1

Northern Ireland

Test or assessment by a UKAS accredited laboratory or an independent consultant with appropriate experience.

10 Adhesion

Tests indicate that the adhesion of the system to concrete and metal is sufficient to resist the effects of any wind suction, elevated temperatures, thermal shock or minor movement likely to occur in practice.

11 Resistance to foot traffic

Tests indicate that the system has adequate resistance to any damage that might be caused by sharp implements or stones. However, unnecessary traffic should be avoided. For warm roof applications where the user load is above 150 N, a protection board should be used.

12 Durability



Integritank Liquid Applied Roofing, when fully protected and subject to normal service conditions will provide an effective barrier to the transmission of liquid water and water vapour for the design life of the structure in which it is incorporated.

Installation

13 General

13.1 Installation of Integritank Liquid Applied Roofing must be carried out only by authorised contractors trained and approved by the Certificate holder.

13.2 The application should proceed while air and substrate temperatures are between 0°C and +30°C, provided the substrate is above the dew-point and in accordance with the Certificate holder's *Technical Datasheets*.

13.3 Detailing, upstands should be carried out in accordance with the Certificate holder's instructions.

14 Site and surface preparation

14.1 Substrates where the product is applied must be properly prepared in accordance with the Certificate holder's instructions.

14.2 Adhesion to substrates will depend upon the condition and cleanliness of the substrate.

Substrates must be visibly dry, sound and free from loose materials or contamination (eg moss, algae).

14.3 Damaged areas/substrate defects (eg blow holes/voids) must be filled with a suitable filling material in accordance with the Certificate holder's instructions.

14.4 Deck surfaces should be free from sharp projections such as fixing bolts, concrete nibs.

14.5 Gutters and outlets should be checked to ensure they are, and remain clear of all debris.

14.6 All points of potential weakness such as splits, cracks, joints and crazed surfaces must be prepared as per the Certificate holder's instructions.

15 Procedure

15.1 Concrete surfaces should be primed using PA1 or PAR1 Primer depending on site conditions. The primers may be applied by spray, brush or roller. Ponding of the primer must be avoided.

15.2 Application rates are given in Table 3.

Table 3 Application rates

Primer	Rate (kgm ⁻²)	Drying time (mins at 20°C)
PA1	0.15–0.25	60
PAR1	0.15–0.30	45

15.3 Integritank Liquid Applied Roofing (Spray Grade) is supplied as Part A and Part B⁽¹⁾. Immediately before use, the pre-weighed Catalyst is stirred into Part B and mixed thoroughly. Part A and Part B are metered and mixed in an airless spray unit at a rate of 1:1.

(1) Note: Part B is typically pigmented yellow, white or grey.

15.4 Integritank Liquid Applied Roofing (Spray Grade) is spray applied in two coats of contrasting colours. Typically, the first coat is pigmented yellow and second coat pigmented grey or white.

15.5 Each coat must be applied to give a minimum wet film thickness of 1.2 mm to ensure a minimum dry film thickness of 1.0 mm and a total minimum dry film thickness of 2.0 overall, including peaks, arrises and irregularities in the substrate. This can be achieved by a coverage rate of 1.4 kgm⁻² per coat on a smooth surface. This coverage rate will vary with surface irregularity.

15.6 The second coat can be applied directly onto the first coat once it has cured. This will vary with temperature but is typically one hour at 23°C.

Day joints

15.7 Where the membrane is to be joined to an existing Integritank Waterproofing membrane and at day joints the new application should be lapped onto the existing by a minimum of 50 mm.

15.8 Where the existing membrane is clean, additional preparation is not necessary.

15.9 Where the existing membrane is dirty or contaminated, surface should be cleaned with a suitable solvent.

16 Repair of defects

Pin/blow holes

16.1 After application of each coat, any identified pin/blow holes should be overcoated with Integritank (Spray Grade) or (Hand Grade) Waterproofing membrane with an additional minimum wet film thickness of 1.2 mm per coat.

Blisters and damage

16.2 Any blisters or damage should be made good by cutting back to sound material, the periphery prepared if necessary as for lapping, and a repair coat of Integritank (Spray Grade) or (Hand Grade) Waterproofing membrane applied as in sections 15.5 and 15.6, ensuring a minimum peripheral lap of 50 mm around the repair.

16.3 Where the damage is through to the substrate, the exposed surface should first be cleaned and then re-primed.

17 On-site quality control

Site control checks should be made by the authorised contractor in accordance with the Certificate holder's instructions.

Technical Investigations

The following is a summary of the technical investigations carried out on Integritank Liquid Applied Roofing.

18 Tests

Samples of the product were obtained for testing. The results, which are typical values for the material, are summarised in Tables 4 and 5.

Table 4 Physical properties — Integritank Liquid Applied Roofing (Spray Grade) Waterproofing

Test (units)	Method ⁽¹⁾	Mean result
Thickness (mm)	BE27, Appendix B : Part A(ai)	2.6
Weight per unit (kgm ⁻²)	BE27, Appendix B : Part A(aii)	3.3
Water vapour permeability (75% RH/25°C) (gm ⁻² day ⁻¹)	BS 3177	3.36
Water vapour resistance (75% RH/25°C) (MNsg ⁻¹)	BS 3177	61.0
Dimensional stability (%)	MOAT 27 : 5.1.6.1	+0.23
Low temperature flexibility (°C)	MOAT 27 : 5.4.2	
unaged		-25
heat aged ⁽²⁾		-20
water soak ⁽³⁾		-25
Tensile strength (Nmm ⁻²)	BS 2782 : 320A	
unaged		8.6
heat aged ⁽⁴⁾		10.6
water soak ⁽³⁾		9.1
UV aged ⁽⁵⁾		8.8
Elongation at break (%)		
unaged		117
heat aged ⁽⁴⁾		124
water soak ⁽³⁾		122
UV aged ⁽⁵⁾		123

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the document.

(2) 56 days heat aged at 70°C.

(3) 28 days water soak at 23°C.

(4) 180 days heat aged at 70°C.

(5) 500 hours UV aged.

Table 5 Service performance — *Integritank Liquid Applied Roofing (Spray Grade) Waterproofing*

Test (units)	Method ⁽¹⁾	Mean result
Resistance to water pressure (6 metre head)	MOAT 27 : 5.1.4	no penetration
Resistance to chisel impact 23°C 0°C	BE27, Appendix B : Part C(v)	no penetration no penetration
Resistance to static indentation — steel substrate unaged at 60°C water exposed at 60°C water exposed at 35°C	EOTA TR-007	L ₄ L ₂ L ₄
Resistance to dynamic indentation — steel substrate unaged heat aged ⁽²⁾	EOTA TR-006	L ₄ L ₄
Fatigue movement unaged heat aged ⁽²⁾	EOTA TR-008	pass pass
Resistance to cracking 23°C 0°C	BE27, Appendix B : Part C(iv)	no damage no damage
Resistance to aggregate indentation	BE27, Appendix B : Part C(vi)	no penetration
Tensile bond strength to concrete (Nmm ⁻²) unaged 28 days heat aged at 70°C 28 days water soak at 23°C	BE27, Appendix B : Part C(vii)	0.62 0.73 0.55
Resistance to sliding	MOAT 27 : 5.1.7	no slippage

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the documents.

(2) 200 days heat aged at 70°C.

19 Investigations

19.1 The manufacturing process was examined, including the methods adopted for quality control, and details obtained of the quality and composition of the materials used.

19.2 An assessment of existing data from BBA Agrément Certificate No 99/R111 Eliminator (One Coat) Bridgedeck Waterproofing System and BBA Test Report No 1641 was made in relation to the system's use in warm roof applications (protected insulation system).

Bibliography

BS 2782-3 : Methods 320A to 320F : 1976 *Methods of testing plastics — Mechanical properties — Tensile strength, elongation and elastic modulus*

BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*

BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS 8217 : 1994 *Code of practice for built-up felt roofing*

MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*

BE27 *Waterproofing and Surfacing of Bridge Decks, Appendix B : Department of Transport Checks and Tests for the Approval of Waterproofing Systems for Concrete Decks to Highway Bridges*

EOTA Technical Report TR 006 (May 1999), *Liquid Applied Roof Waterproofing Kits (LARWK) — Determination of the resistance to dynamic indentation*

EOTA Technical Report TR 007 (May 1999), *Liquid Applied Roof Waterproofing Kits (LARWK) — Determination of the resistance to static indentation*

EOTA Technical Report TR 008 (May 1999), *Liquid Applied Roof Waterproofing Kits (LARWK) — Determination of the resistance to fatigue movement*

Conditions of Certification

20 Conditions

20.1 This Certificate:

- (a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;
- (b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;
- (c) is valid only within the UK;
- (d) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (e) is copyright of the BBA;
- (f) is subject to English law.

20.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

20.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabrication including all related and relevant processes thereof:

- (a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked by the BBA or its agents; and

(c) are reviewed by the BBA as and when it considers appropriate.

20.4 In granting this Certificate, the BBA is not responsible for:

- (a) the presence or absence of any patent or similar rights subsisting in the product or any other product;
- (b) the right of the Certificate holder to market, supply, install or maintain the product; and
- (c) the nature or standard of individual installations of the product or any maintenance thereto, including methods and workmanship.

20.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.



In the opinion of the British Board of Agrément, Integritank Liquid Applied Roofing is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 03/4060 is accordingly awarded to Stirling Lloyd Polychem Ltd.

On behalf of the British Board of Agrément

Date of issue: 24th October 2003

Chief Executive

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British Board of Agrément

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