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Agrément Certificate
13/5051
Product Sheet 2

TRIFLEX COLD LIQUID APPLIED WATERPROOFING AND SURFACING SYSTEMS

TRIFLEX PROPARK SOLVENT-FREE CAR PARK WATERPROOFING AND SURFACING SYSTEMS

This Agrément Certificate Product Sheet(1) relates to the Triflex ProPark Solvent-Free Car Park Waterproofing and Surfacing Systems, a range of liquid-applied systems for use as waterproofing and wearing surfaces on car park decks.

(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 to the interior of a structure (see section 6).

Properties in relation to fire — the systems can contribute to a structure being unrestricted under the national Building Regulations (see section 7).

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

Resistance to mechanical damage — the systems will accept the traffic loads and effects of thermal and other minor movement likely to occur in practice (see section 9).

Durability — under normal service conditions, the systems will have a service life in excess of 15 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 Agrement

Hardy Giesler
Chief Executive Officer

Date of Second issue: 9 April 2020

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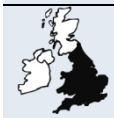
Regulations

In the opinion of the BBA, Triflex ProPark Solvent-Free Car Park Waterproofing and Surfacing Systems, 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: Use of the systems can enable a structure to be unrestricted under this Requirement. See section 7 of this Certificate.

Requirement: **C2(b)** **Resistance to moisture**
Comment: The systems will enable a structure to satisfy this Requirement. See section 6 of this Certificate.

Regulation: **7(1)** **Materials and workmanship**
Comment: The systems are acceptable. See section 11.1 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 11.1 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 can contribute to a roof being 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 system will enable a structure 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 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)(b)(i)** **Fitness of materials and workmanship**
Comment: The systems are acceptable. See section 11.1 and the *Installation* part of this Certificate.

Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The systems can enable a structure 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 systems can enable a roof to be unrestricted under 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* (3.2 and 3.3) of this Certificate.

Additional Information

CE marking

The Certificate holder has taken the responsibility of CE marking the systems in accordance with harmonised European standard EN 1504-2 : 2004.

Technical Specification

1 Description

1.1 Triflex ProPark Solvent-Free Car Park Waterproofing and Surfacing Systems comprise a waterproofing membrane, wearing course and finish based on liquid-applied polymethylmethacrylate resins.

1.2 Components of the systems are:

- Triflex ProPark — a liquid-applied, two-component polymethylmethacrylate-based waterproofing membrane. Also available as a thixotropic version
- Triflex DeckFloor — a liquid-applied, three-component polymethylmethacrylate-based coating comprising Triflex DeckFloor R resin, Triflex DeckFloor S Filler and Triflex Catalyst. Also available as a thixotropic version
- Triflex 110 g Reinforcement — a polyester reinforcement fleece with a nominal mass per unit area of 110 $g \cdot m^{-2}$
- graded aggregates for incorporating into the systems to produce a wearing layer, including dried quartz (0.7 to 1.2 mm) and emery (1.0 to 3.0 mm)
- Triflex Cryl Primer 276 — a two-component, polymethylmethacrylate primer for use on porous substrates such as concrete and cementitious screeds
- Triflex Cryl Primer 222 — a two-component, polymethylmethacrylate primer for use on asphalt and other bituminous substrates
- Triflex Cryl Finish 202 — a two-component, polymethylmethacrylate-based unpigmented finish
- Triflex Cryl Finish 209 — a two-component, polymethylmethacrylate-based decorative finish available in a range of colours
- Triflex ProDetail — for use at details and for repairs, and the subject of Product Sheet 4 of this Certificate
- Triflex Cleaner — cleaner used for cleaning tools, cleaning substrates and the reactivation of the cured Triflex ProPark membrane prior to overcoating when work is interrupted for periods in excess of 12 hours.

1.3 The waterproofing component of the systems is the subject of ETA 04/0019, under the name Triflex ProTerra, issued by Deutsches Institut für Bautechnik (DIBt). In accordance with ETAG 005, Part 1 and Part 4, the levels of Use Categories are:

External fire performance class	$B_{ROOF}(t1)$, $B_{ROOF}(t2)$, $B_{ROOF}(t3)$ and $B_{ROOF}(t4)$
Reaction to fire Euroclass	E
Categorisation by working life	W3 (25 years)
Categorisation by climatic zones	M (moderate) and S (severe)

Categorisation by imposed loads	
most compressible substrate	P4
least compressible substrate	P4
Categorisation by roof slope	S1 (<5%) to S4 (>30%)
Categorisation by surface temperature	
lowest	TL4 (-30°C)
highest	TH4 (90°C)
Resistance to wind loads	>50 kPa
Statement on dangerous substances(1)	none contained.

(1) Dangerous substances as listed in the European Commission database.

1.4 Other items which may be used with the systems, but which are outside the scope of this Certificate, are:

- primers for use on damp concrete surfaces
- primers and pre-treatments for use on open textured and porous cementitious substrates
- anti-corrosion and etch primers for use on metals
- compounds for small and large scale filling, levelling and repair
- fibre reinforced detailing resin for complex, less critical and difficult-to-access details.

Details of suitable products/specifications may be obtained from the Certificate holder.

1.5 Details of application rates for the various components of the systems are given in Table 1.

Table 1 Triflex ProPark System details

Component	Minimum application rate ($kg \cdot m^{-2}$)	
	Triflex ProPark	Triflex ProPark Emery
Primer	0.4	0.4
Triflex ProPark/ProPark Thixo waterproofing membrane reinforced with Triflex 110 g Reinforcement	3.0	3.0
Triflex DeckFloor/DeckFloor Thixo	4.0	4.0
Quartz (0.7 mm – 1.2 mm)	6	–
Emery (1.0 – 3.0 mm)	–	7
Triflex Cryl Finish 209/202	0.60	0.8

2 Manufacture

2.1 The systems components are manufactured by batch processes.

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 EN ISO 9001 : 2015 by DEKRA (Certificate 80408283/4-3).

3 Delivery and site handling

3.1 The components of the systems are delivered to site in packs consisting of liquid base resin and powder catalyst components. The packs bear a label that includes the component's name, health and safety information, and batch number. The components are available in the pack sizes detailed in Table 2.

Table 2 Pack sizes

Component	Pack sizes
Triflex ProPark	20 kg, 999 kg
Triflex ProDetail	5 kg, 10 kg, 15 kg
Triflex DeckFloor R Resin	10 kg, 910 kg
Triflex DeckFloor S Filler	23 kg
Triflex Cryl Finish 202/209	10 kg, 980 kg
Triflex Catalyst	100 g, 1 kg (bags), 25 kg (box)
Triflex Cryl Primer 276	10 kg, 910 kg
Triflex Cryl Primer 222	10 kg, 910 kg
Triflex Cleaner	9 litre, 27 litre
Triflex 110 g Reinforcement	50 m (length) x 15, 20, 26.25, 35, 52.5, 70 or 105 cm (widths) rolls.

3.2 The systems components must be stored in a cool, dry location and protected from freezing temperatures and direct sunlight. When stored in accordance with the manufacturer's instructions they will have a shelf-life of at least six months. Rolls of Triflex 110 g Reinforcement must be stored flat in a dry, clean environment and protected from moisture. Triflex Catalyst must be stored at a temperature below 30°C in closed containers, away from sources of ignition and protected from direct sunlight.

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 Sheets.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Triflex ProPark Solvent-Free Car Park Waterproofing and Surfacing Systems.

Design Considerations

4 General

4.1 Triflex ProPark Solvent-Free Car Park Waterproofing and Surfacing Systems, when applied to a concrete or asphalt surface of a concrete deck designed in accordance with BS EN 1992-1-1 : 2004 and its UK National Annex or its equivalent, are satisfactory for use as a combined waterproof/wearing surface for car park decks and ramps.

4.2 The systems have good chemical resistance to diesel, oils, hydraulic fluid, aqueous solutions of acids, alkalis and de-icing salts, and are unaffected by contact with an alkaline substrate. Prolonged exposure to petrol must be avoided. Large spillages should be cleaned as soon as possible and the system inspected for damage.

4.3 Installations of the systems should be subject to planned inspection and maintenance schedules and any damage repaired (see sections 10 and 14).

5 Practicability of installation

The systems should only be installed by installers who have been trained and approved by the Certificate holder.

6 Weathertightness

The systems will resist the passage of moisture to the inside of the structure and can accommodate any movement due to cracking permitted by BS EN 1992-1-1 : 2004 and its UK National Annex, without leakage and so enable a structure to satisfy the requirements of the national Building Regulations.

7 Properties in relation to fire

7.1 When tested to DD CEN/TS 1187 : 2012, Test 4, a composite build-up comprising 19 mm thick plywood primed with a synthetic rubber resin, 120 mm thick PIR Insulation board bonded to a vapour control membrane with a two-component PUR adhesive, a 0.6 mm thick bitumen carrier membrane, the Triflex ProPark Solvent-Free Car Park Waterproofing and Surfacing System (pebble grey) applied at a rate of 3.1 $kg \cdot m^{-2}$, including Triflex 110 g Reinforcement, was classified in accordance with BS EN 13501-5 : 2005 as European Class $B_{ROOF}(t4)$.

(1) Fire test and classification reports, reference 321301 and 316530 respectively, conducted by Exova Warringtonfire. Report available from the Certificate holder.

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

8 Adhesion

The adhesion of the systems to concrete and asphalt substrates is sufficient to resist the effects of any wind suction, elevated temperature, thermal shock or structural movement likely to occur in practice. Acceptable adhesion to other substrates must be confirmed by test.

9 Resistance to mechanical damage

9.1 The systems can accept, without damage, the foot and vehicular traffic likely to occur in practice. Where continuous heavy point loading is envisaged additional protection should be considered. The Certificate holder must be consulted for advice.

9.2 Where a system has to bridge construction or movement joints, the Certificate holder must be consulted for approved detail specifications.

10 Maintenance

10.1 Installations of the systems must be subject to a planned maintenance programme to ensure that accumulated debris is cleared and drainage outlets are kept clear, and to check for contamination and damage to the system, eg loss of protective finish and/or colour fade.

10.2 Washing of the systems may be carried out using water and a mild detergent. Strong alkalis, acids or bleach must not be used. The Certificate holder must be consulted for advice on suitable cleaning products.

10.3 Where damage has occurred it should be repaired, at the earliest opportunity, in accordance with section 14 and the Certificate holder's instructions.

11 Durability

11.1 Accelerated weathering tests and evidence from existing installations confirm that satisfactory retention of physical properties is achieved. All available evidence indicates that under normal service conditions, the systems, subject to planned maintenance as described in section 10, will have a service life in excess of 15 years.

11.2 Some colour change to the finish coat may be expected when exposed to UV radiation. The degree of colour change likely to occur in use will depend on the specific colour. The Certificate holder should be consulted for more information.

Installation

12 General

12.1 Installation of Triflex ProPark Solvent-Free Car Park Waterproofing and Surfacing Systems must be in accordance with the Certificate holder's instructions and this Certificate.

12.2 Concrete structures must be designed and built in accordance with the UK National Annex to BS EN 1992-1-1 : 2004 in conjunction with BS EN 1992-1-1 : 2004 or its equivalent.

12.3 Standard mix new concrete should be well compacted and finished to a dense, smooth finish without excess laitance, and allowed to cure for a minimum period of 28 days. Where rapid curing or modified concrete mixes are installed, the certificate holder must be consulted.

12.4 Concrete surfaces must have a minimum compressive strength of 25 $N \cdot mm^{-2}$ and be mechanically prepared, eg using enclosed shot blasting, to be free from laitance and other contamination. All residues must be removed by vacuuming.

12.5 Installation must not be carried out during inclement weather, eg rain, fog or snow, and the ambient air and substrate temperature must be between 0 and 35°C, and at least 3°C above the dew point.

12.6 Substrates to which the systems are to be applied must be sound, clean, frost-free, dry and free from sharp projections. The Certificate holder's advice must be sought with regard to the suitability of the substrate to receive the system, suitable cleaning procedures and the use of a proprietary surface cleaner/HSE approved fungicidal wash where required.

12.7 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. The Certificate holder must be consulted for suitable repair products.

12.8 Concrete and asphalt surfaces must be primed with Triflex Cryl Primer 276 and Triflex Cryl Primer 222 respectively.

12.9 Adhesion checks must be carried out to ensure that the systems are compatible with the existing surfaces. The Certificate holder must be consulted for details of suitable test methods and requirements before use.

12.10 Detailing, such as at upstands, penetrations and joints, must be carried out using Triflex ProDetail in accordance with the Certificate holder's instructions. Where use of Triflex ProDetail is not practicable owing to the complexity of detail or for joints, the Certificate holder must be consulted for an alternative solution.

12.11 All equipment must be cleaned with Triflex Cleaner.

13 Procedure

Waterproofing layer

13.1 The Triflex ProPark base component is mixed thoroughly using a slow speed agitator fitted with a suitable mixing paddle. The required quantity of catalyst is added, and stirring is continued until the mixture is lump-free, and in any event for at least two minutes. The amount of catalyst required will depend on the ambient temperature, and the manufacturer's technical data sheet/product label must be consulted for the required amount.

13.2 A layer of the mixed Triflex ProPark resin is applied with a lambswool roller to the clean, prepared and, if required, primed substrate at a minimum application rate of 2.0 $kg \cdot m^{-2}$.

13.3 Triflex 110 g Reinforcement is rolled and embedded into the wet coating, avoiding creasing and trapped air. Adjacent lengths of the reinforcement must overlap by a minimum of 50 mm (100 mm if left over 12 hours), ensuring that there is sufficient coating to fully encapsulate it. Additional coating is applied if required.

13.4 A second coat of mixed Triflex ProPark resin is applied, wet on wet, by roller at a minimum application rate of 1.0 $kg \cdot m^{-2}$.

13.5 On ramps, Triflex ProPark Thixo must be used.

Wearing Layer

13.6 A layer of Triflex DeckFloor mixed in accordance with the manufacturer's instructions is applied with a trowel or stub roller at a minimum application rate of 4.0 kg m^{-2}.

13.7 Triflex DeckFloor Thixo is available as an alternative to Triflex DeckFloor (see Table 1).

13.8 Graded dried aggregate is evenly broadcast into the wet coating at an approximate rate of 6 or 7 $kg \cdot m^{-2}$ depending on the system (see Table 1). The coating is allowed to cure for a minimum of one hour, after which excess aggregate should be swept away and the treated area vacuum cleaned.

Finish coat

13.9 A coat of Triflex Cryl Finish 209/202 mixed in accordance with the manufacturer's instructions is applied over the cured wearing layer at a coverage rate of between 0.60 and 0.80 $kg \cdot m^{-2}$, depending on the aggregate used.

13.10 At each stage the system should be checked to ensure that it has been applied to achieve the minimum consumption. If a localised area has been applied below the minimum consumption, the affected area must be removed and reinstated to specification.

13.11 If work is interrupted for periods in excess of 12 hours, the cured membrane must be reactivated by wiping with Triflex Cleaner. Overcoating must proceed after evaporation of the cleaner has occurred (approximately 20 minutes), but within 60 minutes, otherwise the process must be repeated.

14 Repair

14.1 Areas of damaged system must be cut back to sound, well-adhering material and cleaned with Triflex Cleaner.

14.2 After the cleaner has evaporated, the system is installed as described in section 13, ensuring that there is at least a 100 mm overlap over the existing sound material.

14.3 A check for adequate adhesion must be carried out once the system has cured.

Technical Investigations

15 Tests

Tests were conducted on samples of Triflex ProPark Solvent-Free Roof Waterproofing and Surfacing Systems to determine:

- resistance to cracking
- resistance to fatigue
- resistance to abrasion
- slip resistance
- resistance to penetration by chloride ions
- water vapour permeability/water vapour diffusion resistance coefficient (μ)
- tensile strength and elongation
- watertightness
- tensile bond strength
- resistance to fatigue

- crack bridging capability
- resistance to dynamic indentation
- resistance to static indentation
- resistance to low temperatures
- resistance to high temperatures
- effect of heat ageing
- effect of exposure to surface water
- effect of exposure to UV-A radiation.

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 Data on fire performance were assessed.

16.3 Test data relating to the components of the systems were assessed.

16.4 Existing installations were visited to provide additional evidence of the systems' in-service durability.

Bibliography

BS EN 1992-1-1 : 2004 + A1 : 2014 *Eurocode 2 — Design of concrete structures — General rules and rules for buildings* NA + A2 : 14 to BS EN 1992-1-1 : 2004 + A1 : 2014 UK National Annex to *Eurocode 2 — Design of concrete structures — General rules and rules for buildings*

BS EN 13501-5 : 2005 + A1 : 2009 *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*

EN 1504-2 : 2004 *Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality control and evaluation of conformity — Surface protections systems for concrete*

EN ISO 9001 : 2015 *Quality managements systems — Requirements*

ETAG 005 : 2000, Rev 2004 Part 1 Guideline for European Technical Approval of Liquid Applied Roof Waterproofing Kits –General

ETAG 005 : 2000, Rev 2004 Part 4 *Guideline for European Technical Approval of Liquid Applied Roof Waterproofing Kits – Specific Stipulations for Kits Based on Flexible Unsaturated Polyester*

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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