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Agrément Certificate

13/5051

Product Sheet 9

TRIFLEX COLD LIQUID APPLIED WATERPROOFING AND SURFACING SYSTEMS

TRIFLEX SMARTTEC SOLVENT-FREE WATERPROOFING SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to Triflex SmartTec, for use as a solvent and isocyanate free, liquid-applied roof waterproofing for new and existing flat, protected zero fall 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 interior of a building (see section 6).

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

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

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

Durability — under normal service conditions, the system will provide a durable roof waterproofing 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 Second issue: 19 November 2021

Date of First issue: 15 November 2018

Hardy Giesler
Chief Executive Officer

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

*The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk
Readers MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.*

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

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Regulations

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



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

Requirement:	B4(1)	External fire spread
Comment:		The system is restricted by this Requirement in some circumstances. See section 7.4 of this Certificate.
Requirement:	B4(2)	External fire spread
Comment:		On a suitable substructure, the system may enable a roof to be unrestricted under this Requirement. See sections 7.1 to 7.3 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The system can satisfy this Requirement. See section 6 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The system is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The system satisfies the requirements of this Regulation. See sections 10.1 and 11 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	2.6	Spread to neighbouring buildings The system is restricted under clause 2.6.4 ⁽¹⁾⁽²⁾ of this Standard in some circumstances. See section 7.5 of this Certificate.
Standard:	2.8	Spread from neighbouring buildings
Comment:		The system, when applied to a suitable substructure, may enable a roof to be unrestricted under clause 2.8.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 7.1 to 7.3 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 6 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The system can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	12	Building standards applicable to conversions
Comment:		Comments in relation to the system under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



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

Regulation:	23(a)	Fitness of materials and workmanship
Comment:	(b)(i)	The system is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.

Regulation:	28(b)	Resistance to moisture and weather
Comment:		The use of the system can enable a roof to satisfy the requirements of this Regulation. See section 6 of this Certificate.
Regulation:	36(b)	External fire spread
Comment:		On a suitable substructure, the system may enable a roof to be unrestricted under the requirements of this Regulation. See sections 7.1 to 7.3 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* (3.1 and 3.4) of this Certificate.

Additional Information

NHBC Standards 2021

In the opinion of the BBA, Triflex SmartTec, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 7.1 *Flat roofs, terraces and balconies*.

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

CE marking

The Certificate holder has taken the responsibility of CE marking the system in accordance with European Technical Assessment 17/0284.

Technical Specification

1 Description

1.1 Triflex SmartTec is based on a reinforced, one part, liquid-applied, solvent and isocyanate free, silane terminated polyether. The system comprises:

- Triflex SmartTec — a one-component, solvent and isocyanate-free, silane terminated polyether. Available in stone grey and traffic grey
- Triflex 110 g Reinforcement — a polyester fleece with a nominal mass per unit area of 110 g·m⁻², for use in reinforcing the system.

1.2 The levels of Use Categories in accordance with ETAG 005 : March 2004 from ETA 17/0284 are given in Table 1.

Table 1 Levels of Use Categories

Characteristic	ETAG 005 categories
External fire performance	B _{ROOF} (t4)
Reaction to fire	Euroclass E
Categorisation by working life	W3 (25 years)
Categorisation by climatic zone	M (moderate) and S (severe)
Categorisation by imposed loads	P1 to P4 (from low to high)
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

1.3 Triflex SmartTec Fibre is a one part, liquid-applied, solvent and isocyanate free, silane terminated polyether, containing fibres for reinforcement, used for detail waterproofing in areas that are complex, less critical or difficult-to-access.

1.4 Triflex Cleaner is used for cleaning tools and substrates, and the reactivation of the cured Triflex SmartTec membrane prior to overcoating when work is interrupted for periods in excess of 24 hours.

1.5 Other items or components which may be used with the system, but which are outside the scope of this Certificate, are:

- primer and pre-treatment for glass
- primer for steel
- primers and pre-treatments for single ply membranes based on PVC, PVC-P, FPO, TPE and EPDM
- bitumen blocker
- Triflex TecGrip 620- inter layer adhesion promoter
- compounds for small and large scale filling, levelling and repair.

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

2 Manufacture

2.1 Triflex SmartTec is 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, EN ISO 14001 : 2015 and EN ISO 50001 : 2011 by DEKRA (Certificates 80408283/4, 170408038/3 and 1800414009 respectively).

3 Delivery and site handling

3.1 The liquid component is delivered to site in 7, 14 or 20 kg drums. The drums bear a label that includes the product name, item number, batch number, UN number and Health and Safety information.

3.2 The reinforcement is delivered to site as a 50 m roll and is available in widths of 150, 200, 262.5, 350, 525, 700 or 1050 mm.

3.3 The system 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 upright in a dry, clean environment and protected from moisture.

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

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Triflex SmartTec.

Design Considerations

4 General

4.1 Triflex SmartTec is satisfactory for as a liquid-applied roof waterproofing, for new and existing flat, protected zero fall and pitched roofs with limited access.

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

- concrete
- insulation
- timber
- steel
- reinforced bitumen roofing membranes.

4.3 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 2021*, Chapter 7.1.

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 as specified by the Certificate holder.

4.5 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, direction of falls, etc.

4.6 Pitched roofs are defined for the purpose of this Certificate as those having a fall greater than 1:6.

4.7 Zero fall roofs are defined for the purpose of this Certificate as those having a finished fall which can vary between 0 and 1:80. Reference should also be made to the appropriate clauses in Liquid Roofing and Waterproofing Associations (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls*.

4.8 Structural decks to which the system is to be applied must be suitable to transmit the dead and imposed loads experienced in service. Allowance needs to be made for loading deflections to ensure that the free drainage of water is maintained.

4.9 Imposed loads, dead loading and wind load specifications should be calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-1 : 2002, BS EN 1991-1-3 : 2003 and BS EN 1991-1-4 : 2005, and their UK National Annexes.

4.10 The drainage system for zero fall roofs must be correctly designed, and the following points should be addressed:

- provision made for access for maintenance purposes
- it is particularly important to identify the correct drainage points, to ensure that drainage is sufficient and effective.

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

- as described in the relevant clauses of BS 6229 : 2018, or
- the subject of a current BBA Certificate and used in accordance with the scope of that Certificate.

4.12 The NHBC requires that the roof membranes, once installed, be inspected in accordance with of *NHBC Standards* 2021, Chapter 7.1, Clause 7.1.12, including the use of an appropriate integrity test, where required. Any damage to the membrane is repaired in accordance with section 17 of this Certificate and reinspected

5 Practicability of installation

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

6 Weathertightness



The system will adequately resist the passage of moisture into the interior of a building and enable a roof to comply with 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, and classified in accordance with BS EN 13501-5 : 2005 the following system was classified B_{ROOF}(t4) and so is unrestricted with respect to proximity to a boundary by the documents supporting the national Building Regulations⁽¹⁾:

- 18 mm thick plywood
- a layer of Triflex FastPrime
- a layer of a self-adhesive vapour control layer
- a layer of two-component PUR adhesive
- 120 mm thick PIR Insulation board
- layer of Triflex SmartTec applied at a rate of 3 kg·m⁻²

(1) Fire test and Classification reports 369067 WF 370902 respectively conducted by Exova Warringtonfire. Report available from the Certificate holder

7.2 The system when including an inorganic covering listed in the Annex of Commission Decision 2000/553/EC, is also unrestricted under the national Building Regulations.

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



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



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

8 Adhesion

The adhesion of the system to the substrates given in section 4.2, including day joints, is sufficient to resist the effects of wind suction, thermal cycling or other minor structural movements likely to occur in service.

9 Resistance to mechanical damage

9.1 The system can accept the limited foot traffic and light concentrated loads associated with installation and maintenance. Reasonable care should be taken to avoid puncture by sharp objects or concentrated loads. Where traffic in excess of this is envisaged, such as for maintenance of lift equipment, additional protection to the membrane must be provided as specified by the Certificate holder.

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

10 Maintenance



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

10.2 Any damage must be repaired in accordance with section 14 and the Certificate holder's instructions.

11 Durability



Under normal service conditions, the system will have a service life in excess of 25 years.

Installation

12 General

12.1 Installation of Triflex SmartTec must be in accordance with the relevant clauses of BS 8000-0 : 2014, BS 8000-4 : 1989, BS 6229 : 2018, Liquid Roofing and Waterproofing Association (LRWA) Note 7 – *Specifier Guidance for Flat Roof Falls*, 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 40°C and the relative humidity must be above 30%. The substrate temperature must be at least 3°C above the dew point.

12.3 Substrates to which the system is 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.

12.4 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 system in accordance with the Certificate holder's instructions.

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

12.6 Detailing, such as at upstands and penetrations must be carried in accordance with the Certificate holder's instructions.

12.7 All equipment must be cleaned with Triflex Cleaner.

13 Procedure

13.1 Triflex SmartTec resin is mixed using a slow speed agitator fitted with a suitable mixing paddle until smooth and of a homogeneous consistency, and for at least two minutes.

13.2 A layer of the resin is applied with a lambswool roller to the clean, prepared and, if required, primed substrate at a minimum application rate of $1.5 \text{ kg}\cdot\text{m}^{-2}$.

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 (150 mm if left over 12 hours), ensuring that there is sufficient coating to fully encapsulate it.

13.4 A second layer of the resin is applied immediately at an application rate of $1.5 \text{ kg}\cdot\text{m}^{-2}$ ensuring that the reinforcement is fully encapsulated.

13.5 If work is interrupted for periods in excess of 24 hours, the cured membrane must be cleaned with Triflex Cleaner and after a minimum 20 minutes primed with Triflex TecGrip 620. The existing layer of waterproofing must be overlapped by a minimum of 100 mm by the subsequent application.

14 Repair

Areas of damaged system must be cut back to sound, well-adhering material and the area prepared as described in section 13.5 prior to recoating, ensuring at least a 100 mm overlap.

Technical Investigations

15 Tests

Tests were conducted on samples of the Triflex SmartTec to determine:

- 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 application temperature
- 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.

Bibliography

- BS 6229 : 2018 *Flat roofs with continuously supported flexible waterproof coverings — Code of practice*
- BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*
BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*
- BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*
- BS EN 1991-1-1 : 2002 *Eurocode 1 : Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*
NA to BS EN 1991-1-1 : 2002 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*
- BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 : Actions on structures — General actions — Snow loads*
NA + A2 : 2018 to BS EN 1991-1-3 : 2003 + A1 : 2015 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Snow loads*
- BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Wind actions*
- 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 ISO 9001 : 2015 *Quality management systems — Requirements*
- EN ISO 14001 : 2015 *Environmental management systems — Requirements*
- EN ISO 50001 : 2011 *Energy management systems — Requirements with guidance for use*
- ETAG 005 *Liquid Applied Roof Waterproofing Kits*

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.