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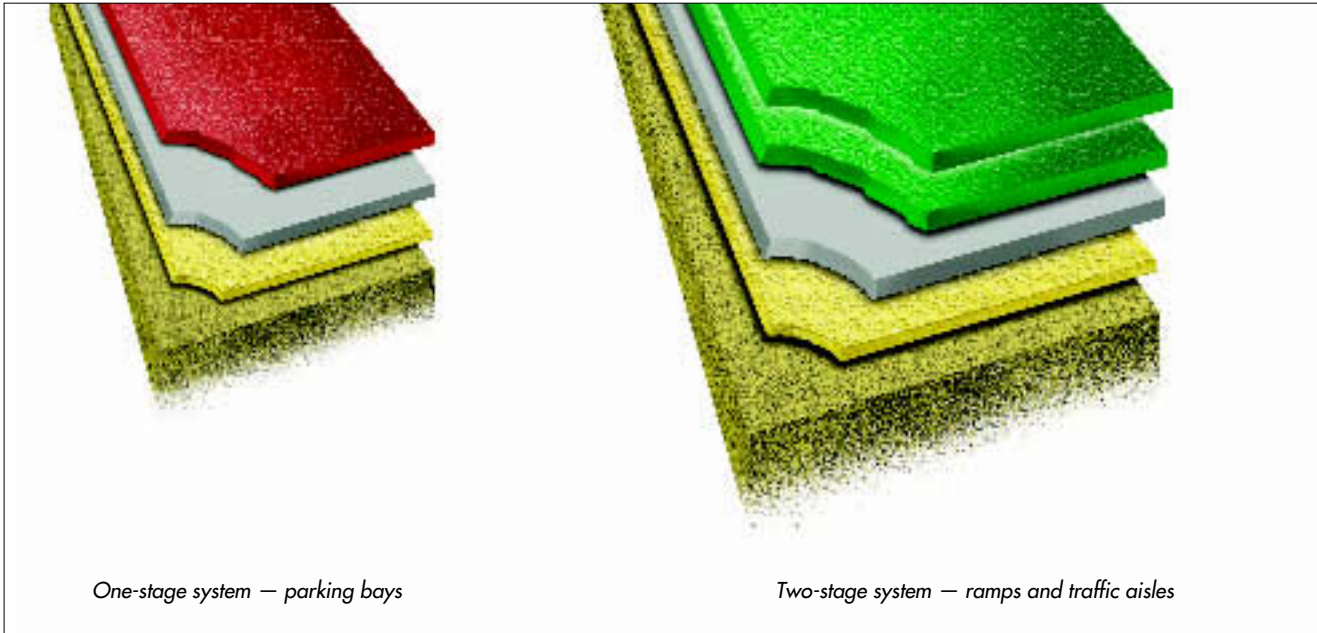
**Agrément
Certificate
No 02/3936**

Designated by Government
to issue
European Technical
Approvals

THORTEX CAR PARK DECKING SYSTEM

Couche de roulement et d'étanchéité pour tabliers de béton
Rissüberdrückende befahrbare Abdichtung

Product




One-stage system — parking bays

Two-stage system — ramps and traffic aisles

- THIS CERTIFICATE RELATES TO THORTEX CAR PARK DECKING SYSTEM, A LIQUID-APPLIED POLYURETHANE RESIN-BASED COATING SYSTEM FOR CAR PARKING DECKS.
- The system is for use as a flexible waterproof wearing surface for trafficked concrete decks, such as car park decks, walkways, access areas and balconies.
- The system is manufactured and marketed by Thortex Division, E Wood Limited.
- Details of Authorised Applicators are available on request.


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 waterproofing with the Building Regulations. In the opinion of the BBA, Thortex Car Park Decking System, 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 system meets this Requirement. See sections 11.1 and 11.2 of this Certificate.
Requirement: C4	Resistance to weather and ground moisture
Comment:	The system can enable a structure to satisfy this Requirement. See section 9 of this Certificate.
Requirement: Regulation 7	Materials and workmanship
Comment:	The system comprises acceptable materials. See sections 13.1 and 13.2 of this Certificate.

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

 In the opinion of the BBA, Thortex Car Park Decking System, 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
Standards: B2.1 and B2.2	Selection and use of materials, fittings, and components, and workmanship
Comment:	The system comprises acceptable materials. See sections 13.1 and 13.2 of this Certificate.

continued

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<p>Regulation: 12 Standard: D9.1 Comment:</p>	<p>Structural fire precautions Fire spread from adjoining buildings The system is unrestricted by this Standard. See sections 11.1 and 11.2 of this Certificate.</p>
<p>Regulation: 17 Standard: G3.1 Comment:</p>	<p>Resistance to moisture Resistance to precipitation The system can enable a structure to satisfy the requirements of this Standard. See section 9 of this Certificate.</p>

3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, Thortex Car Park Decking System, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

<p>Regulation: B2 Comment:</p>	<p>Fitness of materials and workmanship The system comprises acceptable materials. See sections 13.1 and 13.2 of this Certificate.</p>
<p>Regulation: C4 Comment:</p>	<p>Resistance to ground moisture and weather The system can enable a structure to meet this Regulation. See section 9 of this Certificate.</p>
<p>Regulation: E5 Comment:</p>	<p>External fire spread The system is unrestricted under this Regulation. See sections 11.1 and 11.2 of this Certificate.</p>

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 and 8 Precautions during application.*

Technical Specification

5 Description

- 5.1 Thortex Car Park Decking System is a liquid-applied, solvent-free polyurethane coating system applied in one or two stages (see Figure 1).
- 5.2 Products of the system, mixed and applied in the correct proportions on site are:
 Thortex Floor-Tech SFU Primer — a non-pigmented, two-component, solvent-free polyurethane primer for use on porous substrates
 Thortex Floor-Tech CPD — a two-component, solvent-free waterproof membrane
 Thortex Floor-Tech FBX — a two-component, solvent-free polyurethane coating including slip-resistant aggregate for application over Floor-Tech CPD and for use as a wearing course. Available in a mid-grey colour. Other colours are available on request, however, their colour stability has not been assessed
- 5.3 Ancillary materials available are:
 Thortex Flexi-Tech — expansion joint primer
 Thortex Flexi-Tech 60 RG Primer — a rapid drying primer
 Thortex Uni-Tech GP Primer — a primer for non-porous surfaces
 Thortex LD or HD Grip — grit for slip resistance
 Thortex Floor-Tech RS — to repair concrete and rebuild arris edges
 Thortex Universal Cleaner — for equipment cleaning
 dry silica sand — 0.6 mm.

5.4 Thortex Car Park Decking System base components are manufactured by batch processes. A series of quality control checks is conducted on each batch of each component and on the mixed components. The activator components are purchased ready for use.

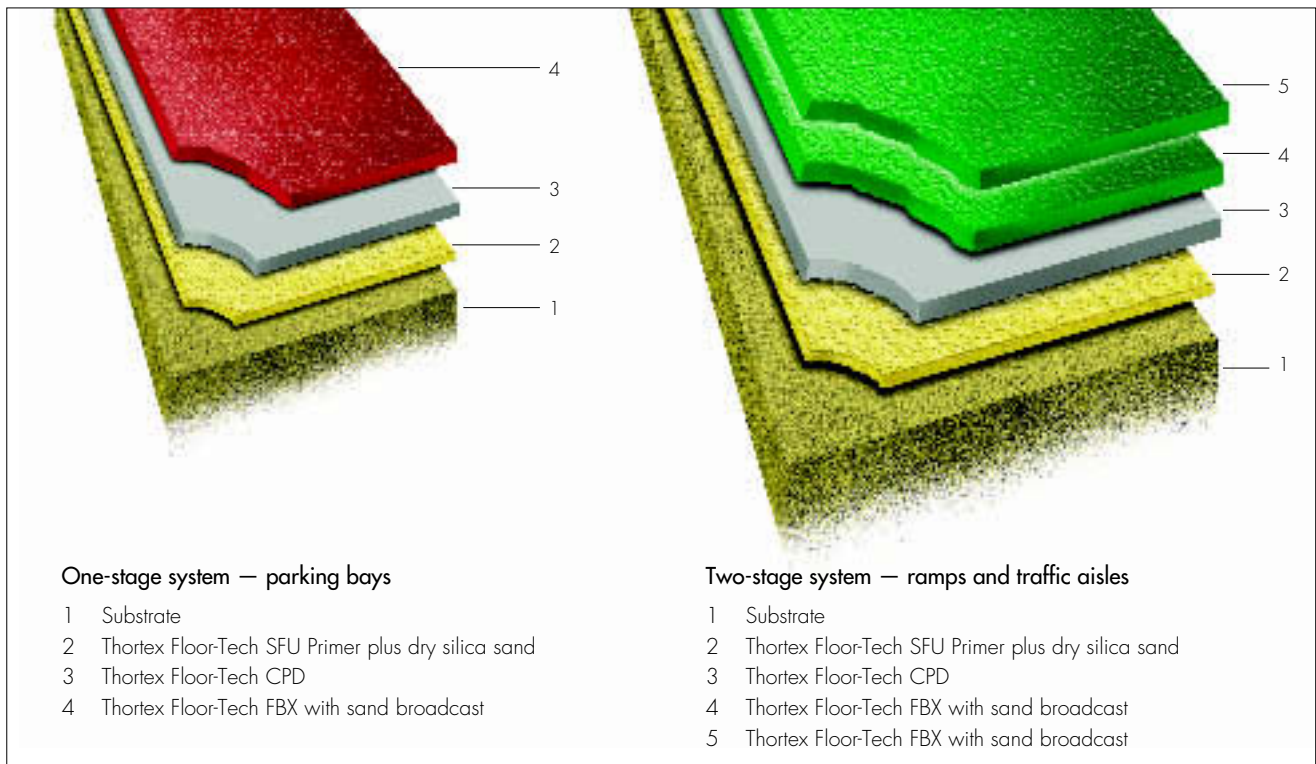
6 Delivery and site handling

- 6.1 The components of the system are delivered to site in labelled air-tight containers, with each component packed separately in the specified mix proportions.
- 6.2 The components are available in composite pack sizes given in Table 1.

Table 1 Packaging weights

Component	Pack weight
Thortex Floor-Tech SFU Primer	3.28 kg pack comprise: Base — 2 litres (tin) Activator — 1 litre (can)
	16.4 kg pack comprise: Base — 10 litres (container) Activator — 5 litres (can)
	Thortex Floor-Tech CPD
	30 kg pack comprise: Base — 20 kg (container) Activator — 10 kg (container)
Thortex Floor-Tech FBX	5 kg pack comprise: Base — 3 litres (tin) Activator — 1 litre (can)
	25 kg pack comprise: Base — 15 litre (tin) Activator — 5 litre (can)

Figure 1 Design specification



One-stage system — parking bays

- 1 Substrate
- 2 Thortex Floor-Tech SFU Primer plus dry silica sand
- 3 Thortex Floor-Tech CPD
- 4 Thortex Floor-Tech FBX with sand broadcast

Two-stage system — ramps and traffic aisles

- 1 Substrate
- 2 Thortex Floor-Tech SFU Primer plus dry silica sand
- 3 Thortex Floor-Tech CPD
- 4 Thortex Floor-Tech FBX with sand broadcast
- 5 Thortex Floor-Tech FBX with sand broadcast

6.3 Each container bears a label with the manufacturer’s name, product name, component identification, batch number and health and safety information.

6.4 The components are classified under The Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 (CHIP2) and all containers bear the appropriate hazard warning label. Flashpoints and hazard classifications are given in Table 2.

Table 2 Flashpoint and hazard classification

Component	Flashpoint (°C)	Classification
Thortex Floor-Tech SFU Primer		
Base	>100	not required
Activator	>200	harmful
Thortex Floor-Tech CPD		
Base	>190	harmful
Activator	>100	irritant
Thortex Floor-Tech FBX		
Base	>275	not required
Activator	220	harmful

6.5 The component containers must be kept tightly sealed and stored under cool and dry conditions, away from other chemicals and sources of ignition.

6.6 When correctly stored in accordance with the Certificate holder’s instructions, the components of the system will have a storage life of at least 12 months. The Certificate holder’s product data sheets should be consulted for details.

Design Data

7 General

7.1 Thortex Car Park Decking System applied to a concrete deck laid in accordance with BS 8110-1 : 1997 is satisfactory for use as a combined waterproof/wearing surface for car park decks and other similar situations.

7.2 The system has good chemical resistance to engine oil, diesel, anti-freeze, battery acid and aqueous solutions of de-icing salts.

7.3 Prolonged exposure to petrol and hydraulic fluid may cause local softening of the membrane. Significant spillages should be cleaned as soon as possible.

7.4 The system can accept, without damage, the foot and vehicular traffic as stated in this Certificate. Where continuous heavy point loading is envisaged, the Certificate holder should be consulted for advice.

8 Precautions during application

8.1 Vapours from the individual components of the system may cause irritation to the respiratory system, eyes and skin. The system should be used only in areas with sufficient ventilation and air movement to prevent the build-up of harmful vapours. Contact with skin, eyes and clothing must be avoided. The Certificate holder’s instructions and the relevant working procedures must be observed at all times.

8.2 Vapours given off from the system during application are flammable and are generally more dense than air. They will tend to move to the lowest point (eg downslopes, gullies). The system should be

used only in the areas with sufficient ventilation to prevent build-up of vapours which could form an explosive mixture. All sources of ignition should be eliminated during application.

8.3 Once cured, the system does not release flammable vapours.

9 Resistance to water and water vapour



Tests confirm that the Thortex Car Park Decking System is an effective barrier against the passage of water and water vapour. It is flexible and can accommodate the movement due to cracking permitted by BS 8110-1 : 1997 and meets the requirements of:

England and Wales

Approved Document C, Requirement C4, Section 5.1

Scotland

Regulation 17, Standard G3.1

Northern Ireland

Regulation C4.

10 Ability to accommodate movement

The system can be detailed to accommodate the movement of designed expansion joints. The Certificate holder should be consulted for their approved specifications.

11 Properties in relation to fire



11.1 Thortex Car Park Decking System applied to a non-combustible substrate has an EXT.F.AC designation when tested to BS 476-3 : 1958.

11.2 The designation of other specifications (eg on combustible substrates) 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 fire testing laboratory or an independent consultant with appropriate experience.

12 Maintenance and repair

12.1 In the event of minor damage, ie cuts and perforations, the system may be repaired by cutting out the damaged area and re-applying Thortex Floor-Tech CPD and Thortex Floor-Tech FBX to the original specification.

12.2 Where substantial damage has occurred, the advice of the Certificate holder should be sought for a suitable repair specification.

13 Durability



13.1 Accelerated weathering tests indicate that the system will retain suitable physical properties.

13.2 The available evidence indicates that with adequate repair and maintenance the system should have a serviceable life of up to 10 years.

Installation

14 General

14.1 Installation of Thortex Car Park Decking System must be carried out in accordance with the Certificate holder's instructions.

14.2 The system must be applied only to concrete substrates that are dry, clean, and free from loose debris or other contaminants that may affect the adhesion of the system.

14.3 Work must not be carried out during or under the threat of inclement weather, unless the system can be fully protected.

14.4 The Thortex Buildup Main System for drive aisles, ramps, and turning circles is:

one coat of SFU Primer (500 µm) plus dry silica sand (0.6 mm), one coat of CPD (1500 µm) and, two coats of FBX (500 µm and sand broadcast per coat).

14.5 The Buildup System for parking bays is:

one coat SFU Primer (500 µm) plus dry silica sand (0.6 mm), one coat of CPD (1500 µm) and one coat of FBX (500 µm) with sand broadcast.

14.6 Checks carried out on site must include:

Before installation

Site inspection — to determine the nature and condition of the substrate, repairs to the substrate and treatment of joints and other details

During installation

Continuous monitoring — to check on environmental conditions, and uniformity of coverage

After installation

Visual inspection — for uniformity of coverage/thickness, and repair of identified faults.

15 Preparation

15.1 Concrete structures should be designed and built in accordance with BS 8110-1 : 1997.

15.2 New concrete should be well compacted and finished, preferably by power floating and power trowelling without excess laitance, to a dense, smooth finish, free from defects. Concrete toppings and screeds should be properly formulated, applied and compacted. They should be bonded to the substrate and have a floated finish with minimum laitance.

15.3 A minimum curing period of 28 days is normally required and the moisture content must not be greater than 7% before new cement-based surfaces are primed.

15.4 Concrete surfaces must be dry, and free from laitance and other contaminants likely to affect the adhesion of the system. The substrate should be prepared by shot blasting or by high-pressure water jetting. All dust and loose material should be removed by vacuum cleaning or sweeping from the surface.

15.5 Cracks and other defects in the substrate should be repaired using an approved repair material. The advice of the Certificate holder should be sought for approved products.

15.6 On all surfaces where the Thortex Car Park Decking System terminates, a rebate of approximately 3 mm by 3 mm should be cut for 'tucking in' the decking system.

16 Application

Primer — (Thortex Floor-Tech SFU Primer)

16.1 The primer components (Part A and Part B) must be thoroughly mixed, using a suitable slow-speed drill and paddle stirrer, until fully homogeneous. The mixed material must be used within 30 minutes of mixing at 20°C.

16.2 The primer should not be applied when the relative humidity exceeds 85% or when the surface to be coated is less than 3°C above the dew-point.

16.3 The mixed primer is applied to the prepared substrate by stiff brush, squeegee or roller.

16.4 At upstands, the primer is applied at rate of 0.1 m² kg⁻¹ at 100 µm thickness and allowed to become tack free before applying the Floor-Tech CPD.

16.5 For application to parking bays, ramps and traffic aisles, the primer application rate is 0.5 kgm⁻² at 500 µm thickness. Whilst the coating is wet, dry silica sand is applied. Once dry, excess, loose silica sand should be swept away, prior to applying the Floor-Tech CPD.

Waterproofing membrane (Thortex Floor-Tech CPD)

16.6 The base component must be thoroughly stirred using a mechanical mixer and whilst continuing stirring, the activator component should be added until fully homogeneous. The mixed material must be used within 25 minutes of mixing at 20°C.

16.7 The application should not be carried out when humidity exceeds 85%.

16.8 Thortex Floor-Tech CPD is applied using a serrated squeegee or roller.

16.9 At upstands, one coat of the CPD is applied on the primed surfaces at a nominal 3 m²kg⁻¹ at 250 µm thickness.

16.10 For application to parking bays, the CPD is applied at a rate of 2 kgm⁻² at 1.5 mm thickness. The membrane can be overcoated after 16 hours or overnight cure and should be overcoated within 48 hours.

16.11 For ramps and traffic aisles areas, the CPD membranes is applied at a rate of 2 kgm⁻² at 1.5 mm thickness. The wearing coat can then be applied after six to eight hours or overnight cure. The first coat should be overcoated within 48 hours with the wearing coat.

Wearing coat (Thortex Floor-Tech FBX)

16.12 The base component must be stirred using a mechanical mixer and whilst continuously stirring, the activator component should be added until fully

homogeneous. The mixed material must be used within 25 minutes of mixing at 20°C.

16.13 Application should not be carried out when humidity exceeds 85%. Application is best carried out when the surface to be coated is above 10°C.

16.14 The wearing coat should be applied within 48 hours of the waterproofing membrane at a rate of 0.75 kgm⁻² at 500 µm thickness. Whilst the coating is wet, 0.6 mm dry silica sand is broadcast at a coverage rate of 3.5 kgm⁻². The surface is then allowed to dry for 16 hours or overnight and all loose sand should be removed.

16.15 On all ramps and traffic aisles, a second wearing coat should be applied incorporating silica sand as specified in 16.14 and left to dry for 16 hours or overnight and all loose sand should be removed.

Technical Investigations

The following is a summary of the technical investigations carried out on Thortex Car Park Decking System.

17 Tests

The results of characterisation and performance tests carried out by the BBA are summarised in Tables 3 and 4.

Table 3 General physical properties

Test (unit)	Method ⁽¹⁾	Results
Weight per unit area (gm ⁻²) Free films SFU + CPD + FBX (2 coats)	Direct measurement	6.99 3.55
Ash content Free film CPD	BS 2782-4 : 454A	18.0
Water absorption (%) Free film CPD	BS 2782 : 430A	2.24
Water vapour permeability (gm ⁻² day ⁻¹) 75% RH, 25°C SFU + CPD + FBX	BS 3177	0.81
Tensile strength (Nmm ⁻²) and elongation (%) free films SFU + CPD + FBX (2 coats)	BS EN ISO 527-1 BS EN ISO 527-3	
control		4.4/21.8
1 day heat aged at 70°C		4.1/20.3
7 days heat aged at 70°C		4.8/31.6
28 days heat aged at 70°C		5.2/22.4
UV aged UVB 313 cycling 4 hours UV at 50°C/4 hours condensation at 50°C for 1000 light hours	BS EN ISO 4892-3	5.8/26.8
Nail tear (N) SFU + CPD + FBX (2 coats)	MOAT 27 : 5.4.1	111

(1) Test methods are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the various documents.

18 Other investigations

18.1 An assessment was made of independent fire test reports relating to the system's performance in fire.

18.2 An assessment was made of the system's durability and methods of maintenance and repair.

Table 4 Service performance

Test (unit)	Method ⁽¹⁾	Results	
Resistance to water pressure SFU + CPD + FBX	MOAT 27 : 5.1.4	satisfactory	
Low temperature flexibility CPD free film	MOAT 27 : 5.4.2	satisfactory at -25°C	
Resistance to chloride ion penetration (%) SFU + CPD + FBX on concrete substrate	BD 47 : Appendix B, Section B4.2(e)	<0.01	
Resistance to chisel impact (free films) SFU + CPD + FBX (2 coats)	BBA Test Method T1/1B		
0°C		surface mark only	
20°C		surface mark only	
SFU + CPD + FBX			
0°C		surface mark only	
20°C		surface mark only	
Resistance to abrasion SFU + CPD + FBX (2 coats) on concrete substrate	Generally to BS 784		
mean loss (gh ⁻¹)		1.15	
total loss (g)		6.90	
Skid resistance (SRV) SFU + CPD + FBX (2 coats) on concrete substrate	BBA Test Method T1/10	before	after
using rubber type 4S dry/wet		abrasion	abrasion
using rubber type TRL dry/wet		66/58	62/56
		89/60	86/64
Hardness (IRHD) CPD free film	IRHD hardness meter		
control		77	
1 day/7 day exposure to:			
petrol		76/78	
diesel		75/77	
used engine oil		75/77	
battery acid		75/54	
anti-freeze		77/77	
hydraulic fluid		69/69	
salt solution		78/77	
FBX free film			
control		99.5	
1 day/7 day exposure to:			
petrol		99.5/99	
diesel		99.5/99	
used engine oil		99.5/99.5	
battery acid		99.5/99.0	
anti-freeze		99/99.5	
hydraulic fluid		99/99	
salt solution		99/99	
Resistance to static indentation SFU +CPD + FBX rigid substrate	MOAT 27 : 5.1.9	L ₄	
Resistance to dynamic indentation SFU +CPD + FBX concrete substrate	MOAT 27 : 5.1.10	I ₄	
Resistance to cracking SFU + CPD + FBX (2 coats) on concrete blocks	BBA Test Method T1/12		
0°C		wearing surface cracked at 2.5 mm crack width	
20°C		wearing surface cracked at 1.25 mm crack width	
Tensile bond strength (Nmm ⁻²) RS screed on concrete blocks	BBA Test Method T1/14		
control		failure mode	
water immersion 7 days at 23°C		1.78 mainly 100% within concrete	
		1.71 mainly 100% within screed concrete	
SFU + CPD + FBX on concrete		1.45 mainly 80% within concrete and 20% epoxy bond	
control			
heat aged at 70°C			
1 day		1.64 mainly 90% within concrete 10% epoxy bond	
7 days		1.78 mainly 90% within concrete 10% epoxy bond	
28 days		1.66 mainly 100% within concrete	
water immersion		1.27 mainly 90% within concrete	
7 days at 23°C		10% epoxy bond	
SFU + CPD + FBX on asphalt			
control		1.51 mainly 100% membrane/asphalt bond	
heat aged at 70°C			
28 days		2.24 mainly 100% membrane/asphalt bond	
water immersion			
7 days at 23°C		1.49 mainly 100% membrane/asphalt bond	

(1) Test methods are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the various documents.

Bibliography

BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*

BS 784 : 1953 *Methods of test for chemical stoneware*

BS 2782-4 : Methods 430A to 430D : 1983 *Methods of testing plastics — Chemical properties — Determination of water absorption at 23°C with allowance for water-soluble matter*

BS 2782-4 : Methods 454A and 454B : 1978 *Methods of testing plastics — Chemical properties — Determination of ash — Determination of sulphated ash*

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

BS 8110-1 : 1997 *Structural use of concrete — Code of practice for design and construction*

BS EN ISO 527-1 : 1996 *Methods of testing plastics — Mechanical properties — Determination of tensile properties — General principles*

BS EN ISO 527-3 : 1996 *Plastics — Determination of tensile properties — Test conditions for films and sheets*

BS EN ISO 4892-3 : 2000 *Plastics — Methods of exposure of laboratory light sources — Fluorescent UV lamps*

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

BD 47 *Waterproofing and Surfacing of Concrete Bridge Decks, Appendix B Certification Test Requirements for Waterproofing Systems on concrete Bridge Decks*

Conditions of Certification

19 Conditions

19.1 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) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (d) is copyright of the BBA.

19.2 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, shall be construed as references to such publication in the form in which it was current at the date of this Certificate.

19.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabricating process(es) 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.

19.4 In granting this Certificate, the BBA makes no representation as to:

- (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 of individual installations of the product, including methods and workmanship.

19.5 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, Thortex Car Park Decking System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 02/3936 is accordingly awarded to Thortex Division, E Wood Limited.

On behalf of the British Board of Agrément

A handwritten signature in black ink, appearing to read 'P. Q. Newson'.

Chief Executive

Date of issue: 24th June 2002