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Agrément Certificate
08/4532
Product Sheet 1 Issue 4

SARNAFIL WATERPROOFING MEMBRANES

SARNAFIL MECHANICALLY FASTENED ROOF WATERPROOFING MEMBRANES

This Agrément Certificate Product Sheet(1) relates to Sarnafil Mechanically Fastened Roof Waterproofing Membranes, comprising single-ply polymeric sheets, for use on flat and pitched roofs with limited access.

(1) Hereinafter referred to as 'Certificate'.

The assessment includes

Product factors:

- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review

KEY FACTORS ASSESSED

Section 1. Mechanical resistance and stability
Section 2. Safety in case of fire
Section 3. Hygiene, health and the environment
Section 4. Safety and accessibility in use
Section 5. Protection against noise
Section 6. Energy economy and heat retention
Section 7. Sustainable use of natural resources
Section 8. Durability

The BBA has awarded this Certificate to the company named above for the products described herein. These products 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 Agrément

Date of Fourth issue: 28 September 2023
Originally certificated on 31 March 2008

Hardy Giesler
Chief Executive Officer

This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.

The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).

Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

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

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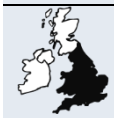
SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that Sarnafil Mechanically Fastened Roof Waterproofing Membranes, 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 Building Regulations 2010 (England and Wales) (as amended)

Requirement:	**B4(1)**	**External fire spread**
Comment:		The products are restricted by this Requirement in some circumstances. See section 2 of this Certificate.
Requirement:	**B4(2)**	**External fire spread**
Comment:		On suitable substructures, the products may enable a roof to be unrestricted under this Requirement. See section 2 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The products, including joints, will enable a roof to satisfy this Requirement. See section 3 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The products are acceptable. See sections 8 and 9 of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)(2)**	**Fitness and durability of materials and workmanship**
Comment:		The use of the products satisfies the requirements of this Regulation. See sections 8 and 9 of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	2.6	Spread to neighbouring buildings
Standard:	2.7	Spread on external walls
Comment:		The products are restricted under clauses 2.6.4(1)(2) and 2.7.2(1)(2) of these Standards in some circumstances. See section 2 of this Certificate.
Standard:	2.8	Spread from neighbouring buildings
Comment:		The products, when applied to a suitable substructure, may enable a roof to be unrestricted under clause 2.8.1(1)(2) of this Standard. See section 2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The use of the products, including joints, will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 and 3.10.7(1). See section 3 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The products can contribute to satisfying 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 products 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(1)(a)(i) (iii)(b)(i)**	**Fitness of materials and workmanship**
Comment:		The products are acceptable. See sections 8 and 9 of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The products, including joints, can satisfy the requirements of this Regulation. See section 3 of this Certificate.
Regulation:	**36(a)**	**External fire spread**
Comment:		The products are restricted by this Regulation in some circumstances. See section 2 of this Certificate.
Regulation:	**36(b)**	**External fire spread**
Comment:		On suitable substructures, the use of the products may enable a roof to be unrestricted under the requirements of this Regulation. See section 2 of this Certificate.

Additional Information

NHBC Standards 2023

In the opinion of the BBA, Sarnafil Mechanically Fastened Roof Waterproofing Membranes, 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.*

In addition, in the opinion of the BBA, the products when installed and used in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards for Conversions and Renovations*, taking account of other relevant guidance within the chapter and the suitability of the substrate to receive the products.

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

Fulfilment of Requirements

The BBA has judged Sarnafil Mechanically Fastened Roof Waterproofing Membranes to be satisfactory for use as described in this Certificate. The products have been assessed for use as mechanically fastened roof waterproofing applications on flat and pitched roofs with limited access.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the products under assessment. Sarnafil Mechanically Fastened Roof Waterproofing Membranes consist of:

- Sarnafil S327-EL — a multi-layer roof waterproofing membrane based on plasticised PVC, incorporating stabilisers
- Sarnafil AT — a multi-layer synthetic roof waterproofing membrane based on flexible polyolefin (FPO), incorporating a combination of glass fibre matting and synthetic scrim and a polymer backing

- Sarnafil TS77 — a multi-layer polyester-reinforced, synthetic roof waterproofing membrane based on FPO, incorporating stabilisers and a non-woven glass fibre inlay.

The products have the nominal characteristics given in Tables 1 and 2.

Table 1 Nominal characteristics

Characteristic (unit)	Sarnafil S327-EL			
Thickness (mm)	1.2	1.5	1.8	2.0
Roll width (m)	2.0, 3.0	2.0, 3.0	2.0, 3.0	2.0, 3.0
Roll length (m)	20	20	20	20
Mass per unit area ($kg \cdot m^{-2}$)	1.6	1.9	2.4	2.6
Roll weight (kg)	64	76	72	78
Colour	A range of colours is available			

Table 2 Nominal characteristics

Characteristic (unit)	Sarnafil AT			Sarnafil TS77/TS77-E			
Thickness (mm)	1.5	1.8	2.5	1.2	1.5	1.8	2.0
Roll width (m)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Roll length (m)	15	15	20	20	20	15	15
Mass per unit area ($kg \cdot m^{-2}$)	2.3	2.2	2.6	1.2	1.45	2.0	2.2
Roll weight (kg)	66	66	52	60	60	60	66
Colour	Grey-upper face Grey-lower face			Grey-lower face Biege-lower face			

Ancillary Items

The following ancillary items are essential to use with the products and have been assessed with them:

- Sarnabar — 2 mm thick, roll formed galvanized bar, perforated for mechanical fixing
- Sarnafast Fastening System — approved by the Certificate holder for use with the membranes.

The Certificate holder recommends the following ancillary items for use with the products, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- Sarnavap 500E, 1000E and 2000E — polyethylene air and vapour control layers (AVCLs)
- Sarnavap Jointing Tape — double-sided tape for use in sealing Sarnavap AVCLs
- Sarnavap 5000E SA and Sikashield VB E71 PE SA — self-adhered bituminous AVCLs
- Sikatherm — a range of thermal insulations comprising rigid urethane foam and mineral fibre
- Sarnaplast 2235 — elastomeric, one-part silicone sealant for sealing edges and perimeter upstand flashings
- Primer 110 — surface primer for use on substrates prior to application of Sarnaplast 2235 on absorbent substrates/metal/Sarnafil S327 membranes
- Primer 501 — a surface primer for use on substrates prior to application of Sarnaplast 2235 on absorbent substrates/metal/Sarnafil AT membranes
- Sarnafil T Prep — a seam preparation for use prior to hot-air welding Sarnafil AT membrane and degreasing metal
- Sarnavap S Welding Cord — welding cord used with Sarnabar to increase wind uplift resistance at perimeters, for use with Sarnafil S327 membranes
- SarnaTred Walkway Pads — for roof maintenance/access.

Applications

The products are intended for use as a waterproofing on flat and pitched roofs with limited access. Decks to which the products are to be applied must comply with the relevant requirements of BS 6229 : 2018 and, where appropriate, *NHBC Standards* 2023, Chapter 7.1.

Definitions for products and applications inspected

- limited access roof — a roof subjected only to pedestrian traffic for maintenance of the roof covering, cleaning of gutters, etc
- flat roof — a roof having a minimum finished fall of 1:80
- pitched roof — a roof having a fall in excess of 1:6.

Product assessment – key factors

The products were assessed for the following key factors, and the outcome of the assessments is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

1 Mechanical resistance and stability

Not applicable.

2 Safety in case of fire

Data were assessed for the following characteristics.

2.1 External fire spread

2.1.1 When tested to CEN/TS 1187 : 2012, Test 4 and classified to EN 13501-5 : 2016, the systems given in Tables 3 to 6 achieved B_{ROOF}(t4).

Table 3 Systems given B_{ROOF}(t4) classification for all pitches

Substrate	AVCL (loose-laid)	Insulation (mechanically fastened)	Membrane (mechanically fastened)	Classification report numbers
Plywood (18 mm or more, 590 kg·m^{-3}) Non-combustible (A1) (8 mm or more, 960 kg·m^{-3} or more) OSB (18 mm or more: 640 kg·m^{-3}) Steel deck (0.7 mm: 9529 kg·m^{-3} or more)	Polyethylene: reaction to fire classification E or better	Polyisocyanurate (PIR) board with an aluminium composite foil on both sides. Thickness: 50 mm or more Density: 32 kg·m^{-3} Facing/backing: aluminium foil: 125 g·m^{-2} Reaction to fire classification: F or better	Sarnafil S327-EL Thickness: 1.2-2.0 mm Surface weight: 1500-2500 g·m^{-2} Reinforcement: Polyester woven scrim 95 g·m^{-2} or less Colour: any colour	22240F(1) and 22240G(1)

(1) Fire test report references 22240F and 22240G, conducted by Warrington Fire. Copies are available from the Certificate holder.

Table 4 Systems given B_{ROOF}(t4) classification for a range of pitches ≤ 10°

Substrate	AVCL (loose-laid)	Insulation (mechanically fastened)	Membrane (mechanically fastened using Sarnabar fixation bars (30 x 1.5 x 7 mm)	Classification report number
OSB (18 mm or more: 640 kgm^{-3}) Steel deck (0.75 mm: 7850 k·gm^{-3} or more) Non-combustible (A1 substrate) (8 mm or more, 1800 kg·m^{-3} or more)	Polyethylene: Reaction to fire classification E or better	Polyisocyanurate (PIR) insulation board with an aluminium facing or glass fleece backing. Thickness: 50 mm or more Density: 30 kg·m^{-3} Facing/backing: Aluminium 243 gm^{-2} or glass fleece 50 g·m^{-2} Reaction to fire classification: F	Sarnafil AT Thickness: 1.5-2.5 mm Surface weight: 1650-2800 g·m^{-2} Backing: Polypropylene fleece 20 gm^{-2} Reinforcement: Polyester grid 75 g·m^{-2} and glass fleece 35 g·m^{-2} Colour: Beige	21452P(1)

(1) Fire test report reference 21452P, conducted by Warrington Fire. Copies are available from the Certificate holder.

Table 5 Systems given B_{ROOF}(t4) classification for a pitch of 0°

Substrate	AVCL (loose-laid)	Insulation (mechanically fastened)	Membrane (mechanically fastened using Sarnabar fixation bars (30mm x 1.5mm x7mm)	Classification report numbers
OSB (18 mm or more: 640 kgm^{-3}) Steel deck (0.75 mm or more : 7850 kg·m^{-3}) Non-combustible (A1 substrate) (8 mm or more, 1800 kg·m^{-3} or more)	Polyethylene: Reaction to fire classification E or better	Polyisocyanurate (PIR) insulation board with an aluminium facing or glass fleece backing. Thickness: 50 mm or more Density: 30 kg·m^{-3} Facing/backing: aluminium 243 g·m^{-2} or glass fleece 50 g·m^{-2} Reaction to fire classification: F	Sarnafil AT Thickness: 1.5-2.5 mm Surface weight: 1650-2800 g·m^{-2} Surface weight combined with PIR glass insulation board: 2800 g·m^{-2} Backing: Polypropylene fleece 20 g·m^{-2} Reinforcement: polyester grid 75 g·m^{-2} and glass fleece 35 g·m^{-2} Colour: Beige	21452N(1)

(1) Fire test report reference 21452N, conducted by Warrington Fire. Copies are available from the Certificate holder.

Table 6 System given $B_{ROOF}(t4)$ classification for a pitch of 0°

Substrate	Vapour Barrier (loose-laid)	Insulation (mechanically fastened)	Membrane (mechanically fastened using Sarnabar fixation bars (30mm x 1.5mm x3mm)	Classification report numbers
OSB (18 mm and 640 kgm^{-3})	Polyethylene: Reaction to fire classification E	Mineral fibre insulation board Thickness: 60mm Density of foam: 120 kg·m^{-3} Reaction to fire classification: A1	Sarnafil AT Thickness: 1.5 mm Surface weight: 1650 g·m^{-2} Polyester grid 76 g·m^{-2} and glass fleece 35 g·m^{-2} Backing: Polypropylene fleece 20 g·m^{-2} Reinforcement: polyester grid 75 g·m^{-2} and glass fleece 35 g·m^{-2} Colour: Beige	21452G(1) and 21542J(1)

(1) Fire test report references 21452G and 21452J, conducted by Warrington Fire. Copies are available from the Certificate holder.

2.1.2 When tested to BS 476-3 : 2004, the following system(1)(2) achieved a classification of EXT.F.AC:

- an 18 mm thick OSB deck, one layer of Sarnavap 1000E VCL, one layer of 140 mm thick mineral wool insulation and one layer of Sarnafil TS77-12E membrane, mechanically fastened(2).

(1) The systems were tested in a flat position (0°).

(2) Fire test report references 228761, conducted by BRE Certification Ltd. Copies are available from the Certificate holder.

2.1.3 On the basis of the data assessed, the constructions described in section 2.1.1 and 2.1.2, will be unrestricted by the documents supporting the national Building Regulations with respect to proximity to a boundary. Restrictions may apply at junctions with compartment walls.

2.1.4 The designation and permissible areas of use of other specifications should be confirmed by reference to the requirements of the documents supporting the national Building Regulations.

2.2 Reaction to fire

2.2.1 When tested to BS EN ISO 11925-2 : 2020 and classified to BS EN 13501-1 : 2018, Sarnafil S327 1.5 and 1.8 mm, and Sarnafil AT 1.5 and 2.5 mm, had a reaction to fire classification of Class E(1).

(1) Classification reports reference EUI-2200312-E, EUI-22-000312-H, EUI-22-000312-F and EUI-22-00312-A, conducted by EFECTIS UK/Ireland Limited. The reports are available from the Certificate holder.

2.2.2 The Certificate holder has not declared a reaction to fire classification for Sarnafil AT 1.8 mm and Sarnafil TS77 Roof Waterproofing Membranes.

2.2.3 On the basis of data assessed, systems incorporating Sarnafil Mechanically Fastened Roof Waterproofing Membranes will be restricted in use under the documents supporting the national Building Regulations in some cases.

2.2.4 In England, the products, when used in pitches greater than 70°, excluding upstands, should not be used less than 1 m from a boundary, or on residential buildings more than 11 m in height or on other buildings more than 18 m in height. Restrictions apply on assembly and recreation buildings. These constructions should also be included in calculations of unprotected area.

2.2.5 In Wales, and in Northern Ireland for the products achieving Class E, when used in pitches greater than 70°, excluding upstands, the products must not be used less than 1 m from a boundary, or on buildings more than 18 m in height. Restrictions apply on assembly and recreation buildings. These constructions should also be included in calculations of unprotected area.

2.2.6 In Scotland, the products achieving Class E, when used in pitches greater than 70°, excluding upstands, must not be used less than 1 m from a boundary, or on buildings more than 11 m in height. Restrictions apply on assembly and recreation buildings. These constructions must also be included in calculations of unprotected area.

2.2.7 In Scotland and Northern Ireland, for systems incorporating the products used in pitches greater than 70°, excluding upstands, which do not achieve the minimum Class E reaction to fire classification to BS EN 13501-1 : 2018, designers should seek guidance on the proposed use of the products from the relevant Building Control Body. These constructions should also be included in calculations of unprotected area.

3 Hygiene, health and the environment

Data were assessed for the following characteristics.

3.1 Weathertigthness

3.1.1 Results of weathertightness tests are given in Table 6.

Table 7 Weathertightness

Product assessed	Assessment method	Requirement	Result
Sarnafil S327	Water vapour permeability to BS 3177 : 1959	Value achieved	3.5 $g \cdot m^{-2} \cdot 24h^{-1}$
Sarnafil TS7			0.55 $g \cdot m^{-2} \cdot 24h^{-1}$
Sarnafil S327	Water vapour resistance to BS 3177 : 1959	Value achieved	59 $MN \cdot s \cdot g^{-1}$
Sarnafil TS77			373 $MN \cdot s \cdot g^{-1}$
Sarnafil S327	Water absorption to MOAT 46 : 1988	Value achieved	4.4%
	Water pressure to MOAT 27 : 1983(1) (60 kPa)	No leakage after 24 hr exposure	Pass
Sarnafil TS77	Tensile strength of joint to MOAT 27 : 1983(1)	≥25 $N \cdot 50mm^{-1}$	Pass
	Peel strength of joints to MOAT 46 : 1988(1)	≥0.4 N mm	Pass
Sarnafil S327	Air pressure of joints (10kPA) to MOAT 27 : 1983(1)	No leakage at 10 KPa	Pass
Sarnafil S327 1.2 mm thickness on 100 mm mineral wool insulation board on 0.7 mm profiled metal decking	Dynamic wind uplift to MOAT 55 : 1991(1)	Design value(2)	Admissible load 720N/fastener
Sarnafil TS77 1.2 mm thickness on 100 mm thick mineral wool insulation on 0.75 mm profiled metal decking			Admissible load 720N/fastener
Sarnafil TS77 1.5 mm thickness on 100 mm thick mineral wool insulation on 0.75 mm profiled metal decking			Admissible load 780N/fastener

(1) Test carried out before the publication of harmonised European Standard EN 13956 : 2012.
(2) The value for a specific building should be calculated by a suitably competent and experienced individual in accordance with the relevant parts of BS EN 1991-1-4 : 2005 and its UK National Annex.

3.1.2 On the basis of data assessed, Sarnafil Mechanically Fastened Roof Waterproofing Membranes, including joints, when completely sealed and consolidated, will adequately resist the passage of moisture to the inside of a building and so satisfy the requirements of the national Building Regulations.

3.1.3 On the basis of data assessed, the products will sufficiently resist the effects of wind suction likely to be experienced in the UK.

3.2 Resistance to mechanical damage

3.2.1 Results of resistance to mechanical damage tests are given in Table 7.

Table 8 Mechanical damage results

Product assessed	Assessment method	Requirement	Result
Sarnafil S327	Dynamic indentation to	Value achieved	
Sarnafil TS77	Moat 27 : 1983(1)		
	(Chipboard)		I_4
	(EPS)		I_4
	(Perlite)		I_3
	(EPS)		I_3
Sarnafil S327	Static indentation to	Value achieved	
Sarnafil TS77	MOAT 27 : 1983(1)		
	(Concrete)		L_4
	(EPS)		L_4
Sarnafil AT	Resistance to impact to EN 12691 : 2001 (Concrete)	Value achieved	≥ 1500 mm
Sarnafil S327	Tensile strength to BS 2782 – Part 3 : Method 320A : 1976	Value achieved	
	longitudinal direction		20.1 $N \cdot mm^{-2}$
	transverse direction		16.9 $N \cdot mm^{-2}$
Sarnafil TS77	Tensile strength to MOAT 60 : 1997(1)	Value achieved	
	longitudinal direction		1240 $N \cdot 50mm^{-1}$
	transverse direction		1199 $N \cdot 50mm^{-1}$
Sarnafil AT	Tensile strength to BS EN 12311-2 : 2013, Method A	Declared value	
	longitudinal direction	≥950 $N \cdot 50mm^{-1}$	Pass
	transverse direction	≥900 $N \cdot 50mm^{-1}$	Pass
Sarnafil S	Elongation to BS 2782 – Part 3 : Method 320A: 1976	Value achieved	
	longitudinal direction		20%
	transverse direction		20%
Sarnafil TS77	Elongation to MOAT 60 : 1997(1)	Value achieved	
	longitudinal direction		19%
	transverse direction		21%
Sarnafil AT	Elongation to BS EN 12311-2 : 2013, Method A		
	longitudinal direction	≥18% declared	35%
	transverse direction	≥18% declared	26%
Sarnafil S	Tear strength to MOAT 27 : 1983(1)	>150 N	
	Longitudinal direction		Pass
	Transverse direction		Pass
Sarnafil TS77	Tear strength to MOAT 55 : 1991(1)	>150 N	
	Longitudinal direction		Pass
	transverse direction		Pass
Sarnafil AT-15	Tear strength to BS EN 12310-1 : 2000 (nail shank)	>150 N	
	longitudinal direction		Pass
	transverse direction		Pass

(1) Test carried out before the publication of harmonised Standard EN 13956 : 2012.

3.2.2 On the basis of data assessed, Sarnafil Mechanically Fastened Roof Waterproofing Membranes can accept the limited foot traffic and light concentrated loads associated with installation and maintenance. Reasonable care must be taken to avoid puncture by sharp objects or concentrated loads.

3.2.3 Where regular traffic is envisaged, such as for maintenance of lift equipment, a walkway must be provided using concrete slabs supported on bearing pads or an anti-slip walkway with or without a protection sheet.

3.2.4 Systems incorporating the products are capable of accepting minor structural movement while remaining weathertight.

4 Safety and accessibility in use

Not applicable.

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

Not applicable.

7 Sustainable use of natural resources

Not applicable.

8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in the products were assessed and visits to existing sites were carried out to assess the long-term performance of the products in use. Specific test data were assessed as given in Table 8.

Table 9 Results of durability tests

Products assessed	Assessment method	Requirement	Result
Sarnafil S327	Low temperature flexibility to MOAT 27 : 1983(1)	Value achieved	-20°C
Sarnafil TS77	Resistance to folding at low temperature to DIN 53361		
	heat aged for 84 days at 80°C		-25°C
	UV aged for 1000 hrs		-25°C
Sarnafil AT	Low temperature foldability to BS EN 495-5 : 2013		
	upper face		-25°C
	lower face		-25°C
Sarnafil S327	Tensile strength to BS 2782 – Part 3 : Method 320A : 1976	No significant loss of properties after ageing	
	Longitudinal direction		
	heat aged for 56 days at 80°C		Pass
	UV exposure for 500 hrs		Pass
	water immersion for 28 days at 23°C		Pass
	Transverse direction		
	heat aged for 56 days at 80°C		Pass
	UV exposure for 500 hrs		Pass
	water immersion for 28 days at 23°C		Pass
Sarnafil TS77	Tensile strength to MOAT 60 : 1997(1)		
	Longitudinal direction		
	heat aged for 90 days at 80°C		Pass
	UV exposure for 1000 hrs		Pass
	Transverse direction		
	heat aged for 90 days at 80°C		Pass
	UV exposure for 1000 hrs		Pass
Sarnafil S327	Elongation to BS 2782 – Part 3 : Method 320A : 1976	No significant loss of properties after ageing	
	Longitudinal direction	Value achieved	
	heat aged for 56 days at 80°C		Pass
	UV exposure for 500 hrs		Pass
	water immersion for 28 days at 23°C		Pass
	Transverse direction		
	heat aged for 56 days at 80°C		Pass
	UV exposure for 500 hrs		Pass
	water immersion 28 days at 23°C		Pass
Sarnafil TS77	Elongation to MOAT 60 : 1997(1)		
	Longitudinal direction		
	heat aged for 90 days at 80°C		Pass
	UV exposure for 1000 hrs		Pass
	Transverse direction		
	heat aged for 90 days at 80°C		Pass
	UV exposure for 1000 hrs		Pass
Sarnafil TS77	Tensile strength of joint to MOAT 27 : 1983(1)	≥25 N·50mm^{-1}	
	heat aged for 28 days at 80°C		Pass
	water immersion for 28 days at 60°C		Pass
	Peel strength of joints to MOAT 46 : 1988(1)	≥25 N·50mm^{-1}	
	heat aged for 28 days at 80°C		Pass

(1) Test carried out before the publication of harmonised Standard EN 13956 : 2012.

8.2 Service life

8.2.1 Under normal service conditions, Sarnafil S327, Sarnafil TS77 and Sarnafil AT Roof Waterproofing Membranes will have a life of at least 35 Years, provided they are designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

8.2.2 Provided the roof is covered by, and maintained in accordance with, the Certificate holder's maintenance scheme, Sarnafil S327 Roof Waterproofing Membranes will have a service life in excess of 40 years (see section 9.4).

PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

9 Design, installation, workmanship and maintenance

9.1 Design

9.1.1 The design process was assessed and the following requirements apply in order to satisfy the performance assessed in this Certificate.

9.1.1.1 Decks to which the products are to be applied must comply with the relevant requirements of BS 6229 : 2018 and, where appropriate, *NHBC Standards* 2023, Chapter 7.1.

9.1.1.2 For design purposes of flat roofs, twice the minimum finished fall must be assumed, unless a detailed analysis of the roof is available, including overall and local deflection, direction of falls etc.

9.1.1.3 Structural decks to which the products are 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.

9.1.1.4 Imposed loads, dead loading and wind loads must 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.

9.1.1.5 Sarnafil S327 membranes can be adversely affected by contact with bituminous products and polystyrene insulation boards. In these cases, a felt-backed version or a suitable separating layer must be used. Where doubt arises, the advice of the Certificate holder should be sought, but such advice is outside the scope of this Certificate.

9.1.1.6 The resistance to wind uplift of a mechanically fastened waterproofing layer is provided by the fixing bar and fasteners passing through the membranes into the substrate. The number and position of fixings will depend on a number of factors including:

- wind uplift forces to be resisted
- pull-out strength of the fasteners
- tensile properties of the membranes
- appropriate safety factors.

9.1.1.7 The wind uplift forces must be calculated by a suitably experienced and competent individual in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex.

9.1.1.8 The Certificate holder provides a design service which takes into account all the relevant information supplied, and provides a specification for the positioning of fastening bars or washers and the number of fixings required, but such advice is outside of the scope of this Certificate.

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

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

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 The products may be laid in conditions normal to roofing work but must not be laid in wet or damp weather, nor at temperatures below 5°C, unless suitable precautions are taken. The Certificate holder can advise on specific installations, but such advice is outside the scope of this Certificate.

9.2.3 Deck surfaces must be clean, dry and free from sharp projections such as nail heads and concrete nibs. When used over a rough substrate, a suitable protection layer must be laid first.

9.2.4 In all cases, an AVCL must be used directly over the deck. When internal temperatures and humidity conditions will exceed 22°C with 50% relative humidity, special precautions must be taken and the Certificate holder should be consulted, but such advice is outside of the scope of this Certificate.

9.2.5 Insulation boards must be fixed to the substrate in such a way as not to impair the performance of the waterproofing membrane.

9.2.6 Installation must be carried out in accordance with this Certificate and the Certificate holder's instructions and must be carried out by trained and approved installers working in accordance with the relevant clauses of the Certificate holder's instructions, BS 8000-0 : 2014, BS 8000-4 : 1989 and the 2020 SPRA *Single Ply : Design Guide* (S1/2020). A summary of instructions and guidance are provided in Annex A of this Certificate.

9.2.7 The position of the bars or washers and the number of fixing screws required must be in accordance with the fixing specifications provided by the Certificate holder.

9.2.8 The NHBC requires that the Sarnafil Mechanically Fastened Roof Waterproofing Membranes, once installed, be inspected in accordance with *NHBC Standards* 2023 Chapter 7.1, Clause 7.1.11, including the use of an appropriate integrity test, where required. Any damage to the products assessed in this Certificate must be repaired in accordance with section 9.4 of this Certificate and reinspected, in order to maintain products performance.

9.3 Workmanship

Practicability of installation was assessed on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the products should only be carried out by installers who have been trained and approved by the Certificate holder. The records relating to this will be audited by the BBA as part of its programme of surveillance of the Certificate.

9.4 Maintenance and repair

9.4.1 Ongoing satisfactory performance of the products in use requires that they are suitably maintained. The guidance provided by the Certificate holder was assessed by the BBA and found to be appropriate and adequate.

9.4.2 The following requirements apply in order to satisfy the performance assessed in this Certificate:

9.4.2.1 The products must be the subject of six-monthly inspections and maintenance in accordance with the recommendations of BS 6229 : 2018, Chapter 7, and the Certificate holder's own maintenance requirements, where relevant, to ensure continued satisfactory performance.

9.4.2.2 A planned maintenance cycle, including inspections by the Certificate holder at minimum intervals of five years, must be introduced if an extended service life is required.

9.4.2.3 In the event of damage, repairs can be carried out by cleaning the affected area and applying a patch as described in the Certificate holder's instructions.

10 Manufacture

10.1 The production processes for the product have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of the production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

†10.1.6 The BBA has undertaken to review 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.

11 Delivery and site handling

11.1 The Certificate holder stated that the products are delivered to site in in rolls packaged in polythene bearing a label with the product identification, stock number, lot number, bulk roll number, area, date code and the BBA logo incorporating the number of this Certificate.

11.2 Delivery and site handing must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.2.1 Rolls must be stored in a cool, dry area on a clean, level surface, and kept under cover. They must only be unwrapped from packaging at the time of installation, and unused membrane must be returned to its packaging until required.

ANNEX A – SUPPLEMENTARY INFORMATION †

Supporting information in this Annex is relevant to the product but has not formed part of the material assessed for the 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.

CLP Regulations

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

UKCA marking

The Certificate holder has taken the responsibility of UKCA marking the products in accordance with Designated Standard EN 13956: 2012.

CE marking

The Certificate holder has taken the responsibility of CE marking the products, in accordance with harmonised European Standard EN 13956 : 2012.

Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 and BS EN ISO 14001 : 2015 by SQS (Certificate 31982).

Additional information on installation

Procedure

A.1 The membrane must be laid flat onto the substrate, without folds or ripples, and fixed to the deck either using Sarnabar fixed by screws through the membrane, or by the Sarnafast system (see Figure 1) through the overlap of the membrane.

A.2 Sarnabar is weatherproofed by heat welding 200 mm wide strips of Sarnafil membrane over the bar onto the main membrane (see Figure 1).

A.3 At a vertical flashing and penetration of the roof, the horizontal membrane requires additional fastening bars. On the perimeter, the membrane must be secured against tearing by welding a 4 mm diameter G/S or T cord to the membrane beyond the last fastening.

A.4 For continuous fixing, the fastening bars should be positioned with a 10 mm gap to allow for expansion. Ends of the bars should be fixed with screws.

A.5 If the laps are to be hand welded, fastening bars should run at 90° to the side laps.

Steel decks

A.6 Steel decks must be manufactured from galvanized steel with a minimum thickness of 0.7 mm.

A.7 On main roof areas, Sarnabar must always run at 90° to the profiled metal deck corrugations and be mechanically fastened using self-drilling and self-tapping screws and tubes in accordance with the Certificate holder's instructions.

Reinforced concrete decks

A.8 Concrete decks will require pre-drilling. The diameter of the holes should not be less than 6 mm and nylon dowels or self-tapping anchors are recommended. Fastening must be installed in accordance with the Certificate holder's instructions.

A.9 When re-roofing on concrete decks, fastening must be into the concrete. This should be noted particularly when using cement screeds or intermediate layers.

Timber decks

A.10 Fastening bars should be positioned above and fixed to beams or joists. If this is not possible, fastening bars must be positioned across the direction of timber planks, provided the planks are sufficiently fastened to withstand the imposed wind loads.

A.11 Fastening bars must be fixed by the Certificate holder's approved fasteners (nails are not suitable for this purpose). Acceptable loads on each fastener and corresponding space between fasteners in each case are calculated before installation.

Jointing and flashing

A.12 Jointing is by electrically heated hot-air welding. The temperature should be set in accordance with the Certificate holder's instructions.

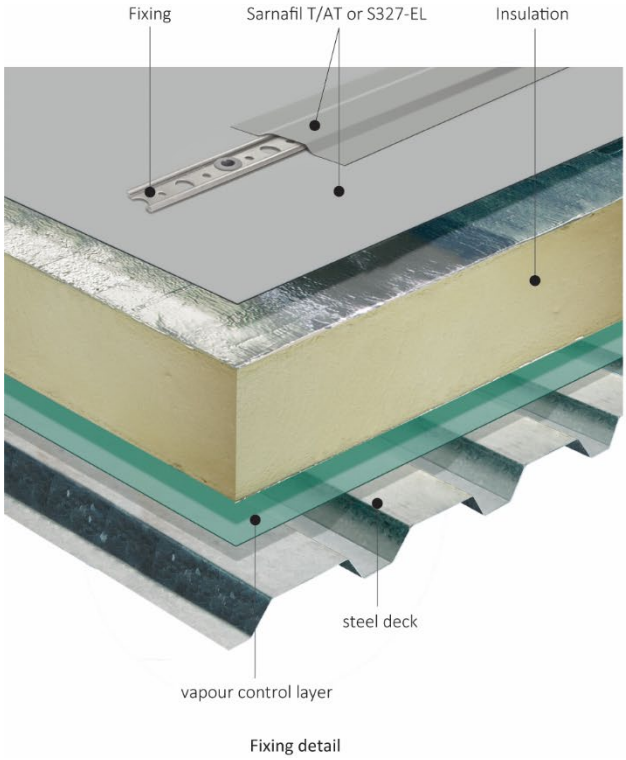
A.13 The welding area must be dry and clean. If Sarnafil T Prep is used, then it should be allowed to flash off totally prior to welding. If the membrane in the weld area has become contaminated, it should be cleaned in accordance with the Certificate holder's instructions.

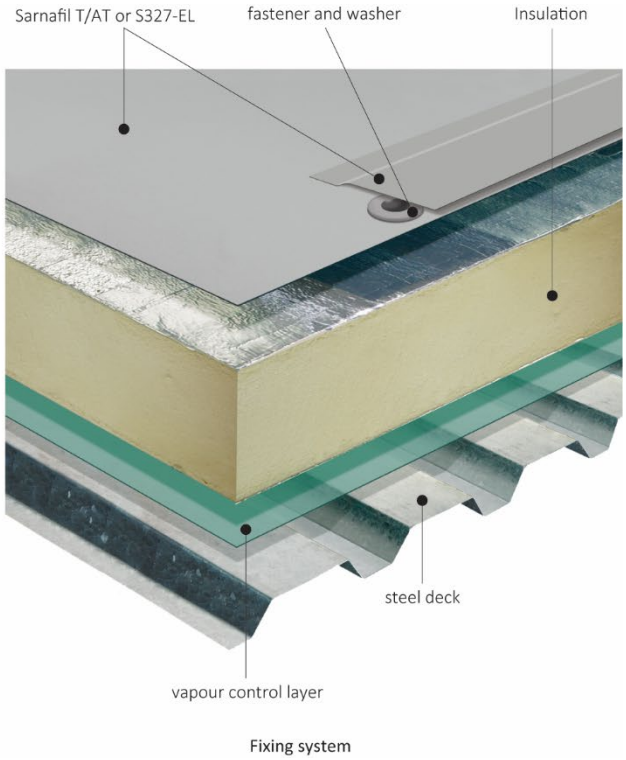
A.14 The welded width of the joint must be a minimum of 25 mm. Care should be taken to ensure overheating of the membrane does not occur, as possible damage to the membrane may result.

A.15 The seam must be tested with a suitable metal probe and any weakness immediately repaired.

A.16 Flashing and detailing are formed in accordance with the Certificate holder's instructions.

Figure 1 Typical installation





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

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

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 EN 495-5 : 2013 *Flexible sheets for waterproofing. Determination of foldability at low temperature. Plastic and rubber sheets for roof waterproofing*

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 : 18 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*

EN 12310 -1 : 2000 *Flexible sheets for waterproofing — Determination of resistance to tearing (nail shank) — Part 1 : Bitumen sheets for roof waterproofing*

BS EN 12311-2 : 2013 *Flexible sheets for waterproofing — Determination of tensile properties — Plastic and rubber sheets for roof waterproofing*

BS EN 12691 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to impact*

BS EN 13501-1 : 2018 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*

BS EN 13956 : 2012 *Flexible sheet for waterproofing — Plastic and rubber sheets for roof waterproofing — Definitions and characteristics*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

BS EN ISO 14001 : 2015 *Environmental management systems — Requirements with guidance for use*

BS EN ISO 11925-2: 2020 *Rection to fire tests- Ignitability of products subjected to direct impingement of flame- Part 2: Single-flame source test*

CEN/TS 1187 : 2012, *Test Methods for external fire exposure to roofs*

MOAT 27 : 1983 *UEAtc General Directive for the Assessment of Roof Waterproofing Systems*

MOAT 46: 1988 *UEAtc General Directive for the Assessment of Roofing Systems with non-reinforced Vulcanised EPDM*

MOAT 55: 1991 1984 *UEAtc Supplementary Guide for the assessment of mechanically fastened roof waterproofing*

MOAT 60 : 1997 *Technical Guide for the approval of reinforced and/or backed roof waterproofing systems made of plasticised PVC sheeting incompatible with bitumen*

DIN 53361 June 1982 *Testing artificial leather and similar sheet materials — Determination of behaviour when folded at low temperature*

Conditions

1 This Certificate:

- relates only to the product 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.

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.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product 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.

4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

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 or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to UKCA marking and CE marking.

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product 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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