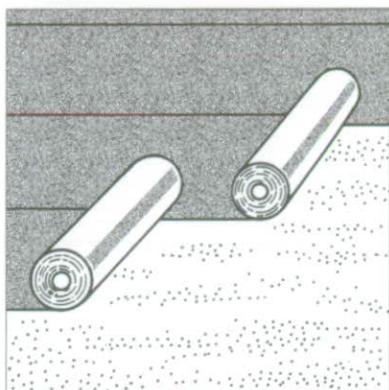


Product



• THIS DETAIL SHEET RELATES TO THE ESHAFLEX 2000 AND 3000 ROOF COVERING SYSTEMS (TORCH-ON).

• The product is for use as:

- (1) a fully or partially bonded one- or two-layer built-up roof waterproofing system on flat and pitched roofs
- (2) a ballasted loose-laid two-layer waterproofing system on flat roofs.

This Detail Sheet must be read in conjunction with the Front Sheets which give the product's position regarding the Regulations, general information relating to the products, and the Conditions of Certification, respectively.

Technical Specification

1 Description

1.1 The Eshaflex Roof Covering Systems (Torch-on) comprise:

Eshaflex 2000 — a spunbonded polyester (180 gm^{-2}) reinforced polymer modified bitumen sheet with a sand-finished upper surface and a thermofusible polythene film under surface, for use as a base sheet or as a cap sheet with additional protection.

Eshaflex 2000 Mineral — a spunbonded polyester (180 gm^{-2}) reinforced polymer modified bitumen sheet with a mineral granular finished upper surface and a thermofusible polythene film under surface, for use as a cap sheet.

Eshaflex 2000 Ceramic — a spunbonded polyester (180 gm^{-2}) reinforced polymer modified bitumen sheet with a ceramic granular finished upper surface and a thermofusible polythene film under surface, for use as a cap sheet.

Eshaflex 3000 — a spunbonded polyester/glass-fibre ($155 \text{ gm}^{-2}/8 \text{ gm}^{-2}$) reinforced polymer modified bitumen sheet with a sand-finished upper surface and a thermofusible polythene film under surface, for use as a base sheet or as a cap sheet with additional protection.

Eshaflex 3000 Mineral — a spunbonded polyester/glass-fibre ($155 \text{ gm}^{-2}/8 \text{ gm}^{-2}$) reinforced polymer modified bitumen sheet with a mineral granular finished upper surface and a thermofusible polythene film under surface, for use as a cap sheet.

Eshaflex 3000 Ceramic — a spunbonded polyester/glass-fibre ($155 \text{ gm}^{-2}/8 \text{ gm}^{-2}$) reinforced

polymer modified bitumen sheet with a ceramic granular finished upper surface and a thermofusible polythene film under surface, for use as a cap sheet

Eshaflex Super — a spunbonded polyester (180 gm^{-2}) reinforced polymer modified bitumen sheet with a sand-finished upper surface and a thermofusible polythene film under surface, for use as a base sheet or as a cap sheet with additional protection.

Eshaflex Super Mineral — a spunbonded polyester (180 gm^{-2}) reinforced polymer modified bitumen sheet with a mineral granular finished upper surface and a thermofusible polythene film under surface, for use as a cap sheet.

Viflex 2000 Torch — a glass-fibre (60 gm^{-2}) reinforced polymer modified bitumen sheet with a sand-finished upper surface and a thermofusible polythene film under surface, for use as a base sheet.

1.2 Eshaflex 2000, 2000 Mineral and 2000 Ceramic are manufactured by saturating and coating 180 gm^{-2} spunbonded polyester reinforcement and Viflex 2000 Torch by saturating and coating a 60 gm^{-2} glass fibre reinforcement with SBS modified bitumen.

1.3 Eshaflex 3000, 3000 Mineral and 3000 Ceramic are manufactured by saturating and coating ($155 \text{ gm}^{-2}/8 \text{ gm}^{-2}$) spunbonded polyester/glass reinforcement with SBS modified bitumen. Eshaflex Super and Eshaflex Super Mineral are manufactured by saturating and coating 180 gm^{-2} spunbonded polyester reinforcement with SBS modified bitumen. The surfaces are finished by application of thermofusible polythene film and/or sand, mineral or ceramic granules. The finished material is cut to length and ejected onto a cardboard tube.

1.4 The products are manufactured to the nominal dimensions listed in Table 1.

Table 1 Nominal dimensions

	Thickness (mm)	Roll width (m)	Roll length (m)	Roll weight (kg)	Weight per unit area (kgm ⁻²)
Eshaflex 2000					
Sand	3.6	1.0	7.5	30	4.0
Mineral	3.6 ⁽¹⁾	1.0	7.5	35	4.7
Ceramic	3.6 ⁽¹⁾	1.0	7.5	38	5.1
Eshaflex 3000					
Sand	3.4	1.0	7.5	31	4.1
Mineral	3.4 ⁽¹⁾	1.0	7.5	33	4.4
Ceramic	3.4 ⁽¹⁾	1.0	7.5	36	4.8
Eshaflex Super					
Super	5.2	1.0	5.0	28	5.5
Mineral	5.4 ⁽¹⁾	1.0	5.0	30	5.9

(1) Thickness on mineral surface.

1.5 Other products used with Eshaflex 2000 roof covering include:

Eshabase-Peral — a bituminised perforated glass fleece for use as a partial bonded underlay.

Esha Quick Primer — a bituminous primer for substructures.

Eshabase G — a bituminised glass fleece with a thermofusible polythene film and anti-tack undersurface.

Eshabase P and Eshabase PEW — bituminised polyester reinforced membranes for use as sub-layers.

1.6 Quality control checks are carried out on the incoming materials, during manufacture and on the final product. Quality control on the final product includes checks on:

- thickness
- width
- length
- mass per unit area.

2 Delivery and site handling

2.1 The membranes are delivered to site in paper wrappings bearing the product identification and the BBA identification mark incorporating the number of this Certificate.

2.2 The rolls must be stored upright on the selvedge end, on a smooth, level surface and kept under cover.


Design Data


3 General

Eshaflex Roof Covering Systems (Torch-on) membranes are satisfactory for use as:

- (a) a fully or partially bonded waterproofing system, as part of a built-up specification and where necessary in conjunction with appropriate roofing felts to BS 747 : 2000 on flat and pitched roofs, and
- (b) a loose-laid, two-layer roof waterproofing system, ballasted with aggregate, on flat roofs with limited access, or under heavy protection (eg concrete tiles) on flat roofs with regular pedestrian traffic.

4 Properties in relation to fire

 4.1 When tested in accordance with BS 476-3 : 1958 a system comprising 18 mm thick roofing grade plywood, one layer of Vilflex 2000 Torch underlay, fully bonded to the plywood by torching and one layer of Eshaflex 2000 Mineral cap sheet, fully bonded to the Vilflex 2000 MEC by torching, achieved an EXT.F.AA rating.

 4.2 A roof is deemed to be designation AA when used for flat roofs with one of the surface finishes defined in the Building Regulations (and listed):

England and Wales


Approved Document B, Appendix A, Table A5, Part (iii)

Northern Ireland

Technical Booklet E, Part N, Table 4.6.

Surface finishes:

- (a) bitumen bedded stone chippings covering the whole surface to a depth of not less than 12.5 mm
- (b) bitumen bedded tiles of a non-combustible material
- (c) sand and cement screed, or
- (d) macadam.

 4.3 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 with Standard D9.1

Northern Ireland

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

Installation

5 General

5.1 Installation of Eshaflex Roof Covering Systems (Torch-On) must be carried out by trained installers working in accordance with the relevant clauses of the manufacturer's instructions and BS 8000-4 : 1989 and BS 8217 : 1992.

5.2 Deck surfaces must be dry, clean and free from sharp projections, such as nail heads, concrete nibs.

5.3 At falls in excess of 5° (1:11), the normal precautions against slippage and the provision for mechanical fixings as required by BS 8217 : 1994, should be observed.

5.4 If the roof is likely to be subjected to uncontrolled pedestrian access, the substructure must meet the requirements of clause 8.3 of BS 8217 : 1994, and one of the surface finishes (1, 2 or 3) described in clauses 8.11 and 8.13 of the code must be used to prevent damage to the roof covering.

3.5 On completion of the roof, the sand-faced cap sheet should have a surface finish applied in accordance with BS 8217 : 1994, clauses 8.11 and 9.17. Surface finishes in the code of practice include:

- (a) stone aggregate in dressing compound
- (b) pre-cast concrete paving slates
- (c) proprietary tiles on bonding compound.

5.6 The mineral and ceramic-faced cap sheets require no additional surface protection.

Application

Loose-laid applications — flat roof

6.1 A separating layer of a paper underlay should be loose-laid over the substructure with loose overlaps of 60 mm minimum.

6.2 A layer of Vilflex 2000 Torch base sheet is then laid with torch-welded overlaps of 100 mm.

6.3 A layer of Eshaflex membrane is then fully torch welded directly to the base sheet with overlaps of 60 mm minimum. The overlaps should be offset at least 100 mm with respect to those of the base sheet.

6.4 A minimum 50 mm depth of aggregate is loaded onto the roof covering. Where roofs are likely to be subjected to uncontrolled pedestrian traffic, however, a concrete tile finish should be used.

Partially bonded applications — flat and pitched roofs

6.5 A layer of bituminised perforated glass fleece should be loose-laid with the anti-adhesive covering facing down, edge to edge, over the substructure.

6.6 A top layer of Eshaflex ceramic or mineral membrane is then fully torch welded directly onto the base layer. Ensure that the bitumen seeps regularly into the perforations. Joints are offset by a minimum of 60 mm. Edge laps of at least 60 mm and end laps of at least 100 mm are required.

6.7 On nailable substructures a layer of Eshaflex membrane is fastened mechanically to the substrate (usually simultaneously with the insulation), using the relevant clauses of BS 8217 : 1994. A top layer of Eshaflex mineral or ceramic membrane is then fully torch welded to the base layer with overlaps of 60 mm minimum.

Fully bonded specification — flat and pitched roofs

6.8 A first layer of Vilflex 2000 Torch should be fully bonded to the substructure with overlaps of 60 mm minimum.

6.9 A top layer of Eshaflex ceramic or mineral membrane is then fully bonded to the first layer, with an offset 60 mm minimum overlapping.

Technical Investigations

The following is a summary of the technical investigations carried out on the Eshaflex Roof Covering Systems (Torch-on).

7 Tests

Results of tests carried out by Kiwa NV which show typical properties for the material are summarised in Tables 2 to 5.

Table 2 Characteristics of reinforcements

Test (units)	Method ⁽¹⁾	Mean results	
		Polyester	Glass fibre
Mass per unit area (gm ⁻²)		182	62
Tensile strength (N per 50 mm)	MOAT 31 : 6C		
longitudinal		675	295
transverse		475	235
Elongation (%)	MOAT 31 : 6C		
longitudinal		35	1.5
transverse		23	1.5

(1) The test document is detailed in the *Bibliography*. Numbers in the table refer to sections of the document.

Table 3 Characteristics of coating mass

Test (units)	Method ⁽¹⁾	Mean result
Fines content (%)	MOAT 31 : 6F	11
Softening point (°C) (ring and ball)	MOAT 31 : 6G	
unaged		120
heat aged ⁽²⁾		89
heat aged ⁽³⁾		112
Low temperature flexibility (°C)	MOAT 31 : 6D	
unaged		-20
heat aged ⁽²⁾		0
heat aged ⁽³⁾		-5
Elastic recovery (%)	MOAT 31 : 6H	
unaged		200
heat aged ⁽²⁾		<25
heat aged ⁽³⁾		25

(1) The test document is detailed in the *Bibliography*. Numbers in the table refer to sections of the document.

(2) Heat aged 180 days at 70°C.

(3) Heat aged 56 days at 80°C.

Table 4 Finished product — physical properties

Test (units)	Method ⁽¹⁾	Mean results	
		Eshaflex 2000 Mineral	Vilflex 2000 Torch
Tensile strength (N per 50 mm)	MOAT 31 : 6C		
longitudinal		835	415
transverse		635	390
Elongation (%)	MOAT 31 : 6C		
longitudinal		55	3.4
transverse		69	3.4
Slip resistance	MOAT 27 : 5.1.7	pass	—
Tearing strength (N)	MOAT 27 : 5.4.1		
longitudinal		380	140
transverse		330	120
Low temperature flexibility (°C)	MOAT 31 : 6D	-20	-20
Unrolling at low temperature	MOAT 27 : 5.4.3	pass	—
Heat resistance (°C)	MOAT 31 : 6E		
unaged		110	120
heat aged ⁽²⁾		80	—
Dimensional stability (%) (free shrinkage)	MOAT 27 : 5.1.6.1		
longitudinal		0.35	—
transverse		+0.20	—

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

(2) Heat aged 180 days at 70°C.

— Indicates not tested.

Table 5 Service performance

Test (units)	Method ⁽¹⁾	Mean result Eshaflex 2000 Mineral
Fatigue strength	MOAT 27 : 5.1.8	pass
Static indentation concrete substrate	MOAT 27 : 5.1.9	L ₄
PS-25 substrate		L ₄
Dynamic indentation concrete substrate	MOAT 27 : 5.1.10	I ₃
Perlite substrate		I ₃
PS-25 substrate		I ₃
Resistance to wind uplift (kPa) System ⁽²⁾	MOAT 27 : 5.1.2.1	>8
Resistance to thermal shock (kPa) System	MOAT 27 : 5.1.5	>8
Resistance to water pressure	MOAT 27 : 5.1.4.1	pass
Integrity of joints	MOAT 27 : 5.2.1	pass
Tensile strength of joints (N per 50 mm)	MOAT 27 : 5.2.2	710

(1) The test document is detailed in the Bibliography. Numbers in the table refer to sections of the various documents.

(2) Chipboard/Vilflex 2000 Torch/Eshaflex 2000 Mineral.

8 Investigations

8.1 Data in the Kiwa Agrément No K111 95/02 and BDA Intron Agrément CTG-422/1 were evaluated in the context of UK roofing practice and building regulations.

8.2 UK data on the fire performance of the product were examined.

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

Bibliography

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

BS 747 : 2000 *Reinforced bitumen sheets for roofing — Specification*

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

BS 8217 : 1994 *Code of practice for built-up felt roofing (supersedes CP 144 : Part 3)*

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

MOAT No 31 : 1984 *Special Directives for the Assessment of Reinforced Homogeneous Waterproof Coverings of Styrene-Butadiene-Styrene (SBS) Elastomer Bitumen*



On behalf of the British Board of Agrément

P. C. Hewitt

Date of Third issue: 4th June 2003

Chief Executive

*Original Detail Sheet issued 14th November 1989. This revised version issued to include change of product name, reference to the revised national Building Regulations and Standards.

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