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Agrément Certificate No 04/4076

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

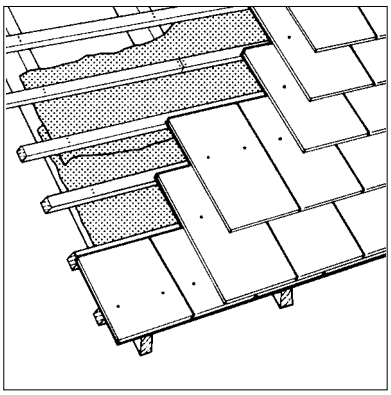
Designated by Government to issue European Technical Approvals

MONARFLEX PROTECT 1F

Sous-toiture
Dachlattung

Product

- *THIS CERTIFICATE RELATES TO MONARFLEX PROTECT 1F, AN UNDERLAY FOR TILED OR SLATED, VENTILATED PITCHED ROOFS IN UNSUPPORTED APPLICATIONS.*
- *The product is installed in the same manner as conventional roof tile underlays and prevents the ingress of wind-blown rain, snow or dust.*
- *The product is resistant to tearing and remains flexible at low-ambient temperatures during installation.*



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 roof waterproofing with the Building Regulations. In the opinion of the BBA, Monarflex Protect 1F, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement:	C4	Resistance to weather and ground moisture
Comment:		Tests for weather resistance indicate that the product contribute towards a tiled or slated roof meeting this Requirement. See sections 9.1 and 9.2 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product comprises acceptable materials. See section 14 of this Certificate.

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

In the opinion of the BBA, Monarflex Protect 1F, 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
Standard:	B2.1	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product can contribute to a construction meeting this Standard. See the *Installation* part of this Certificate.
Standard:	B2.2	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product is an acceptable material. See section 14 of this Certificate.
Regulation:	17	Resistance to moisture
Standard:	G3.1	Resistance to precipitation — Resistance to precipitation
Comment:		The product will contribute towards a roof satisfying this Standard. See sections 9.1 and 9.2 of this Certificate.

3 The Building Regulations (Northern Ireland) 2000

In the opinion of the BBA, Monarflex Protect 1F, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product comprises acceptable materials. See section 14 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		The product will contribute towards a roof satisfying this Regulation. See sections 9.1 and 9.2 of this Certificate.

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 section: *5 Description* (5.2).

Technical Specification

5 Description

5.1 Monarflex Protect 1F is a non-woven spunbonded polypropylene sheet, reinforced with matt black, low-density polyethylene (LDPE) upper surface.

5.2 The product has the nominal characteristics of:

weight of roll (kg)	
15 m	1.95
45 m	5.85
weight per unit area (gm^{-2})	130
thickness (µm)	450
roll length (m)	15, 45
roll width (m)	1

5.3 Monarflex Eaves Guard is manufactured from UV-resistant polymer, for use in protecting underlay at eaves and allowing water run-off into the gutter.

5.4 Quality control tests carried out include, width, weight per unit area and appearance.

6 Delivery and site handling

6.1 Rolls of the product are delivered to site shrink-wrapped on pallets. Each roll is wrapped in polyethylene and the label bears details of company name, product name, dimensions, and the BBA identification mark incorporating the number of this Certificate.

6.2 The rolls must be stored horizontally, on a clean level surface, kept under cover and away from heat sources. Pallets should not be stacked.

Design Data

7 General

Monarflex Protect 1F is satisfactory for use as an underlay in tiled and slated, ventilated, pitched roofs constructed in accordance with BS 5534 : 2003.

8 Strength

8.1 The product will resist the loads associated with the installation of the roof.

8.2 Batten spacing for fixing the tiles and slates should be calculated in accordance with BS 5534 : 2003, Section 5.5.2 (see Table 4 for wind load results).

8.3 The product has adequate resistance to wind uplift forces in most locations in the British Isles and may be considered equal in strength to both Type 1F and 5U roof tile underlays as defined in BS 747 : 2000.

8.4 Project design wind speeds should be determined, and wind uplift forces calculated, in accordance with BS 6399-2 : 1997.

9 Weathertightness

9.1 Data examined confirm that the product will resist the passage of water, wind-blown snow and dust into the interior of a building under all conditions to be found in a roof constructed to BS 5534 : 2003.

9.2 The product should not be used for prolonged periods as a temporary waterproof covering prior to the installation of the roof covering. The period prior to the installation of the roof covering should be kept to a minimum.

10 Risk of condensation

10.1 The product has a higher water vapour permeability than the minimum for conventional roof tile underlays. Factors to be considered in reducing condensation to a satisfactory minimum are described in BS 5534 : 2003. The general design guides contained in BS 5250 : 2002, Sections 8.4.2.1 and 8.4.2.2 must be met when installing this product.

10.2 The product should be treated as an impermeable underlay when considering ventilation of the roof space.

10.3 Typical values of water vapour resistance for the product and other roof sarking materials are given in Table 1.

Table 1 Typical values of water vapour resistance

Material	Water vapour resistance ($MNsg^{-1}$)
Monarflex Protect 1F	190
Traditional felt underlay	570
Polyethylene (0.15 mm)	450

11 Behaviour in relation to fire

The fire properties are similar to BS 747 : 2000, Type 1F felts and, therefore, there is a risk fire can spread if the material is accidentally ignited during maintenance works (eg roofer's or plumber's torch). As with all types of roof tile underlays, care should be taken during building and maintenance to avoid the material becoming ignited.

12 Slip resistance

Care should be taken particularly in wet conditions due to a reduction in slip resistance.

13 Maintenance

Damage to the underlay can be repaired easily prior to the installation of slates or tiles by replacement with another, undamaged sheet over the damaged area.

14 Durability

Monarflex Protect 1F will be virtually unaffected by normal conditions found in a roof space and will have a life comparable with both traditional roof tile underlays, Types 1F and 5U.

Installation

15 General

15.1 Monarflex Protect should be installed and fixed in accordance with the Certificate holder's instruction and the recommendations of BS 5534 : 2003 and BS 8000-6 : 1990. Installation can be carried out in all conditions normal to roofing work.

15.2 When the membrane is used over sarking boards, counter battens must be used and the membrane fixed over the counter battens. The membrane must not be applied directly to the sarking board.

15.3 When the underlay is installed in a cold ventilated roof specification it can be either draped in the traditional manner or used in conjunction with counter battens.

15.4 Overlaps must be provided with the minimum dimensions given in Table 2 and the sheet fixed with galvanized clout nails by traditional methods used with BS 747 : 2000, Type 1F and 5U felts.

Table 2 Minimum overlaps

Roof pitch (°)	Horizontal lap (mm)		Vertical lap (mm)
	Partially supported	Fully supported	
12.5–14	225	150	100
15–34	150	100	100
35+	100	75	100

15.5 Hips, valleys and ridges should be covered with a 600 mm wide strip of the underlay.

15.6 With an open eaves construction, the underlay should be dressed under the gutter. Alternatively, and for closed eaves construction Monarflex Eaves Guards should be used to conduct water into the gutter.

15.7 The period of exposure of the underlay prior to the installation of the roof covering must be kept to a minimum.

15.8 The product has a low coefficient of friction when wet. Therefore, care should be taken when moving or standing on the material in wet conditions.

Technical Investigations

The following is a summary of the technical investigations carried out on Monarflex Protect 1F.

16 Tests

16.1 A sample of Monarflex Protect 1F was obtained from the manufacturer for the purpose of testing. Tests performed by the BBA, which give typical results for the material are summarised in Tables 3 and 4.

16.2 Tests were also carried out on:

- thickness
- width
- weight per unit area
- straightness.

17 Investigations

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

17.2 An examination was made of data in relation to water spray resistance.

Table 3 Physical properties

Test (units)	Method[1]	Mean results	
		Machine direction	Cross direction
Tensile strength (N per 50 mm)	BS EN 12311-1[2] (speed 100 mm min^{-1})		
unaged		340	260
UV heat aged[3]		105	75
Elongation at break (%)	BS EN 12311-1[2] (speed 100 mm min^{-1})		
unaged		96	90
UV heat aged[3]		9	6
Nail tear (N)	BS EN 12310-1[2]	140	150
Dimensional stability	BS EN 1107-2	–0.3	–0.2

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

(2) Carried out with modifications from prEN 13859-1.

(3) 336 light hours UVA at 50°C followed by heat aged at 70°C for 90 days.

Table 4 Service performance

Tests (units)	Method[1]	Mean result
Water vapour permeability ($gm^{-2}day^{-1}$)	BS 3177 (25°C/75% RH)	1.08
Water vapour resistance ($MNsg^{-1}$)	BS 3177 (25°C/75% RH)	190
Mullen burst strength (kNm^{-2})	BS 3137	326
Water penetration	BS EN 1928[2]	Class W1
Resistance to wind loads (kPa)	UEAtc Guide for RTU's 4.2.1	
350 mm[3]		1.0
330 mm[3]		1.0
300 mm[3]		1.5
250 mm[3]		2.5
Steaming water	UEAtc Guide for RTU's 4.2.2	pass
Slip resistance	T1/10[4]	
dry		0.49
wet		0.39

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

(2) Carried out with modifications from prEN 13859-1.

(3) Batten spacing.

(4) BBA test methods.

Bibliography

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

BS 3137 : 1972 *Methods for determining the bursting strength of paper and board*

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

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

BS 5534 : 2003 *Code of practice for slating and tiling (including shingles)*

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*

BS 8000-6 : 1990 *Workmanship on building sites — Code of practice for slating and tiling of roofs and claddings*

BS EN 1928 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of watertightness*

BS EN 1107-2 : 2000 *Flexible sheets for water-proofing — Determination of dimension stability — Plastic and rubber sheets for roof waterproofing*

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

BS EN 12311-1 : 2000 *Flexible sheets for waterproofing — Determination of tensile properties* — Part 1 — *Bitumen sheets for roof waterproofing*

prEN 13859-1 *Flexible sheets for waterproofing — Definitions and characteristics of underlays* — Part 1 *Underlays for discontinuous roofing*

UEAtc Technical Guide for the Assessment of Discontinuous Roofing Underlay Systems : December 2002

Conditions of Certification

18 Conditions

18.1 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) is valid only within the UK;

(d) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;

(e) is copyright of the BBA;

(f) is subject to English law.

18.2 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, are references to such publication in the form in which it was current at the date of this Certificate.

18.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabrication including all related and relevant processes 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 as and when deemed appropriate by the BBA under arrangements that it will determine; and

(c) are reviewed by the BBA as and when it considers appropriate.

18.4 In granting this Certificate, the BBA is not responsible for:

(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 or standard of individual installations of the product or any maintenance thereto, including methods and workmanship.

18.5 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.

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, Monarflex Protect 1F is fit for its intended use provided it is installed, used and maintained as set out in this Certificate.
Certificate No 04/4076 is accordingly awarded to Icopal Ltd.

On behalf of the British Board of Agrément

Date of issue: 31st March 2004 Chief Executive

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