

Icopal Ltd

Barton Dock Road
Stretford
Manchester M32 0YL

Tel: 0161-865 4444 Fax: 0161-865 8433
e-mail: info.uk@icopal.com
website: www.icopal.co.uk



Agrément Certificate
87/1807
Product Sheet 3

ICOPAL NON-BREATHABLE ROOF TILE UNDERLAYS

MONARFLEX TWO F ROOF TILE UNDERLAY

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Monarflex Two F Roof Tile Underlay, for use in tiled and slated ventilated pitched roofs.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Weathertightness — as part of a complete roof, the product will resist the passage of water and wind-blown snow and dust into the interior of the building (see section 5).

Wind loading — when installed with appropriately spaced battens the product's physical properties are deemed adequate to resist the wind loads imposed on the underlay. The product will reduce the wind uplift forces acting on the roof covering (see section 7).

Strength — the product has adequate strength to resist the loads associated with the installation of the roof (see section 8).

Durability — under the normal conditions found in a roof space the product will have a service life comparable to a traditional roof tile underlay (see section 11).



The BBA has awarded this Agrément Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Simon Wroe
Head of Approvals — Materials

Greg Cooper
Chief Executive

Date of First issue: 30 January 2009

Originally certificated on 30 June 2000

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

British Board of Agrément
Bucknalls Lane
Garston, Watford
Herts WD25 9BA

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tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk

Regulations

In the opinion of the BBA, Monarflex Two F Roof Tile Underlay, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	C2(b)	Resistance to moisture
Comment:		The product will contribute to a roof meeting this Requirement. See section 5.1 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The product can contribute to a construction satisfying this Regulation. See sections 10 and 11, and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	3.10	Precipitation
Comment:		The product will contribute to a roof satisfying clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ of this Standard. See section 5.1 of this Certificate.
Regulation:	12	Building standards – conversions
Comment:		All comments given for this product under Regulation 9, 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) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The product does not normally require maintenance. See section 10 of this Certificate.
Regulation:	C4(b)	Resistance to ground moisture and weather
Comment:		The product will contribute to a roof satisfying this Regulation. See section 5.1 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 1 *Description* (1.2).

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of Monarflex Two F Roof Tile Underlay, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 7.2 *Pitched roofs*.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Monarflex Two F Roof Tile Underlay, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure*, Sub-section *Pitched roofs*.

General

This Certificate relates to Monarflex Two F Roof Tile Underlay, for use in tiled or slated ventilated pitched roofs in accordance with the relevant Clauses of BS 5534 : 2003.

The product will also prevent the ingress of wind-blown rain or snow.

Technical Specification

1 Description

1.1 Monarflex Two F Roof Tile Underlay is a low-density polyethylene sheet material incorporating a multifilament polyester reinforcing grid.

1.2 The product's nominal characteristics are:

Thickness (mm)	0.15
Mass per unit area (gm^{-2})	150
Roll length (m)	30
Roll width (m)	1
Roll weight (kg)	4.5
Colour	
top	Black
bottom	Grey

1.3 Quality control checks are carried out on the incoming materials, during production and on the finished product. Quality control checks on the finished product include:

- mass per unit area
- width
- thickness.

2 Delivery and site handling

2.1 Rolls of Monarflex Two F Roof Tile Underlay are delivered to site wrapped in clear polythene sleeves with an internal product label bearing the manufacturer's name and the BBA identification mark incorporating the number of this Certificate.

2.2 Rolls may be stored on end or laid flat and should be kept under cover.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Monarflex Two F Roof Tile Underlay.

Design Considerations

3 General

3.1 Monarflex Two F Roof Tile Underlay is satisfactory for use as a roof tile underlay in tiled or slated ventilated pitched roofs constructed in accordance with the relevant Clauses of BS 5534 : 2003.

3.2 The product has a moderate coefficient of friction when dry that reduces when wet. Care should be taken, especially when wet, during installation work, to avoid slipping.

4 Practicability of installation

Installation can be carried out readily by slaters/tilers experienced with this type of installation.

5 Weathertightness



5.1 Tests indicate that the product will resist the passage of water and wind-blown snow and dust into the interior of a building, under all conditions to be found in a roof constructed in accordance with the relevant Clauses of BS 5534 : 2003.

5.2 The product should not be used for prolonged periods as temporary waterproof covering prior to the installation of slates or tiles.

6 Risk of condensation

6.1 The product should be regarded as an impermeable underlay when considering ventilation of a roof space.

6.2 For design purposes, in roofs designed in accordance with BS 5534 : 2003 or BS 5250 : 2002, Section 8.4, it may be regarded as a Type HR membrane.

6.3 In common with all roofs, care must be taken in the overall design and installation to minimise the risk of water vapour coming into contact with cold parts of the construction. Factors to be considered and minimised include, moisture diffusion through the ceiling, infiltration through unsealed openings/penetrations in the ceilings and services evaporating or venting moisture into cold spaces.

6.4 The risk of condensation is highest in new-build construction during the first heating period, where there is high moisture loading due to wet trades, such as in-situ cast concrete slabs or plaster. The risk of condensation diminishes as the building naturally dries out. See *BBA Information Bulletin No 1 – Roof Tile Underlays in Cold Roofs during the Drying-out Period*.

Ceiling and insulation horizontal (cold ventilated roof)

6.5 Roofs designed and constructed in accordance with BS 5250 : 2002 will adequately limit the risk of condensation.

Ceiling and insulation inclined (warm roof)

6.6 For roofs with an insulated inclined ceiling, ventilation between the insulation and underlay will be required, see section 13.2.

7 Wind loading

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

7.2 Wind loading on the underlay should be calculated in accordance with BS 5534 : 2003, Section 5.5.2.7. For acceptable wind loads with specific batten spacings for the draped product, using a 25 mm deep tiling batten, see section 16, Table for *Physical properties — general*.

8 Strength

The product will resist the normal loads associated with installation of the roof (see section 16, Table for *Physical properties — directional*).

9 Properties in relation to fire

9.1 The product will melt and shrink away from heat, but will burn in the presence of a naked flame.

9.2 There is a risk that fire can spread if it is accidentally ignited during maintenance works, eg by a roofer's or plumber's torch. As with all types of underlay, care should be taken during building and maintenance to avoid the material becoming ignited.

10 Maintenance



As the product is confined to a roof space and has suitable durability (see section 11), there are no maintenance requirements. However, it must be ensured that damage occurring before enclosure is repaired (see section 15).

11 Durability



The product will be virtually unaffected by the normal conditions found in a roof space and will have a life comparable with that of traditional roof tile underlays, provided they are not exposed to sunlight for long periods (see section 12.5). Advice regarding exposure can be obtained from the Certificate holder.

Installation

12 General

12.1 Monarflex Two F Roof Tile Underlay must be installed and fixed in accordance with the Certificate holder's instructions, provisions of this Certificate and the relevant recommendations of BS 5534 : 2003 and BS 8000-6 : 1990. Installation can be carried out under all conditions normal to roofing work.

12.2 The product is installed with the black side uppermost and fixed using galvanized clout nails every 150 mm and lapped to shed water out and down the slope.

12.3 Overlaps must be provided with the minimum dimensions given in Table 1.

Table 1 Minimum overlaps

Roof pitch (°)	Horizontal lap (mm)		Vertical laps (mm)
	Not fully supported	Fully supported	
12.5 to 14	225	150	100
15 to 34	150	100	100
35+	100	75	100

12.4 Minimum overlaps at hips should be 150 mm, and in valleys 300 mm.

12.5 At the eaves, the product should be continued over the tilting fillet or fascia board to extend into the gutter.

12.6 Where possible, eaves guards should be used to protect the product from sunlight and to direct water into the gutter.

13 Procedure

13.1 The product is fixed in the traditional method for roof tile underlays, ie draped between the rafters to allow drainage of liquid water under the tiling battens.

13.2 When used in warm roof specifications, a ventilation gap of at least 50 mm between the insulation and the underlay should be allowed. A vapour control layer should be used on the warm side of the insulation.

14 Finishing

14.1 Detailing of abutments and verges must be in accordance with the Certificate holder's instructions. Ingress of moisture to the roof space should be restricted by sealing around pipes and other penetrations and details.

14.2 The tiling and slating must be carried out in accordance with the relevant Clauses of BS 5534 : 2003, BS 8000-6 : 1990 and the tile/slate manufacturer's instructions, especially when using tightly-jointed slates or tiles.

15 Repair

Damage to the product can be repaired easily prior to the installation of slates or tiles by replacing the damaged areas, by patching and sealing correctly. Care should be taken to ensure that the watertightness of the roof is maintained.

Technical Investigations

16 Tests

16.1 A sample of Monarflex Two F Roof Tile Underlay was obtained from the Certificate holder for testing. The results of the tests carried out by, or on behalf of the BBA are summarised in Tables 2 and 3.

Table 2 Physical properties — directional

Test (units)	Mean result		Method ⁽¹⁾
	Long ⁽²⁾	Trans ⁽³⁾	
Tensile strength (N per 25 mm) unaged	182	155	BS EN ISO 527-3
Elongation at break (%) unaged	21	20	BS EN ISO 527-3
Tear resistance – nail (N) unaged	277	232	BS EN 12310-1
Low temperature flexibility (°C) unaged	-25	-25	MOAT 27 : 5.4.2
heat aged ⁽⁴⁾	-25	-25	

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

(2) Longitudinal direction.

(3) Transverse direction.

(4) Heat aged at 70°C for 56 days.

Table 3 Physical properties — general

Test (units)	Mean result	Method ⁽¹⁾
Mass per unit area (kgm ⁻²)	0.15	Draft MOAT 61 ⁽²⁾
Thickness (mm)	0.17	BS 2782-6.630A
Water vapour permeability at 25°C/75% RH (gm ⁻² day ⁻¹)	0.53	BS 3177
Water vapour resistance (MNsg ⁻¹)	388	BS 3177
Resistance to water pressure	Satisfactory	MOAT 27 : 5.1.4
Slip resistance (coefficient of friction)		T1/10 ⁽³⁾
dry	0.50	
wet	0.39	
Resistance to wind loads (kPa) ⁽⁴⁾		MOAT 69 (4.2.1)
batten spacing 350 mm	0.5 ⁽⁵⁾	
batten spacing 330 mm	1.0 ⁽⁵⁾	
batten spacing 300 mm	1.5 ⁽⁵⁾	
batten spacing 250 mm	2.0 ⁽⁵⁾	
batten spacing 200 mm	2.5 ⁽⁵⁾	

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

(2) Draft MOAT No 61 : 1998 *Guideline for the assessment of polyethylene damp-proof membranes*.

(3) BBA Test Method.

(4) Tested using 25 mm thick battens and 600 mm rafter spacing.

(5) Maximum pressure achieved..

16.2 Tensile strength and elongation on a similar material were also measured after water soak, heat and UV conditioning. The results were assessed as satisfactory.

17 Investigations

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

Bibliography

- BS 2782-6.630A : 1994 *Methods of testing plastics — Dimensional properties — Determination of thickness by mechanical scanning of flexible sheet*
- 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 12310-1 : 2000 *Flexible sheets for waterproofing — Determination of resistance to tearing (nail shank)— Part 1 — Bitumen sheets for roof waterproofing*
- BS EN ISO 527-3 : 1996 *Plastics — Determination of tensile properties — Test conditions for films and sheets*
- MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*
- MOAT No 69 : 2004 *UEAtc Technical Report for the Assessment of Discontinuous Roofing Underlay Systems*

18 Conditions

18.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

18.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, 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/system and the manufacture and/or fabrication including all related and relevant 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.

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

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

18.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does 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; 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. 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 manufacture, supply, installation, use and maintenance of this product/system.

