



Designated by Government
to issue
European Technical
Approvals

FAKRO ROOF TILE UNDERLAYS

Système de revêtement
Dachbelagsystem

Product




• THIS CERTIFICATE RELATES TO FAKRO ROOF TILE UNDERLAYS, FOR USE AS AN UNSUPPORTED OR FULLY SUPPORTED ROOF LINING MATERIAL FOR TILED OR SLATED PITCHED ROOFS.

- The product is for use in warm and ventilated/non-ventilated cold pitched roof systems.
- The product prevents the ingress of wind-blown rain or snow.
- The membrane is resistant to tearing during installation and is flexible at low ambient temperatures.

These Front Sheets must be read in conjunction with the accompanying Detail Sheets which provide specific product information.

Regulations — Detail Sheet 1

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, Fakro Roof Tile Underlays, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: C2(b)

Comment:

Resistance to moisture

Tests for weather resistance indicate that the product contributes towards a tiled or slated roof meeting this Requirement. See the *Weather-tightness* section of these Front Sheets.

Requirement: C2(c)

Comment:

Resistance to moisture

The product can enable a roof to meet this Requirement. See the tinted areas in the *Risk of condensation* section of the relevant accompanying Detail Sheets.

Requirement: Regulation 7

Comment:

Materials and workmanship

The product is an acceptable material. See the *Durability* section of these Front Sheets.

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2 The Building (Scotland) Regulations 2004



In the opinion of the BBA, Fakro Roof Tile Underlays, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Mandatory Standards as listed below.

| | | |
|-------------|------|---|
| Regulation: | 8 | Fitness and durability of materials and workmanship |
| Regulation: | 8(1) | Fitness and durability of materials and workmanship |
| Comment: | | The product can contribute to a construction satisfying this Regulation. See the <i>Durability</i> section of these Front Sheets and the <i>Installation</i> part of the accompanying Detail Sheets. |
| Regulation: | 9 | Building standards — construction |
| Standard: | 3.10 | Precipitation |
| Comment: | | The product is an acceptable material. See clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ of this Standard. See the <i>Weathertightness</i> section of these Front Sheets. |
| Standard: | 3.15 | Condensation |
| Comment: | | The product can enable a roof to satisfy this Standard. See the tinted areas in the <i>Risk of condensation</i> section of the relevant accompanying Detail Sheet. |
| 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). |

3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, Fakro Roof Tile Underlays, 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 is an acceptable material. See the <i>Durability</i> section of these Front Sheets. |
| Regulation: | C4 | Resistance to ground moisture and weather |
| Comment: | | The product will contribute towards a roof satisfying this Regulation. See the <i>Weathertightness</i> section of these Front Sheets. |
| Regulation: | C5 | Condensation |
| Comment: | | The product can enable a roof to satisfy this Regulation. See the tinted areas in the <i>Risk of condensation</i> section of the relevant accompanying Detail Sheet. |

4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See sections: 1 *Description* (1.2) of the accompanying Detail Sheets.

Technical Specification

5 Delivery and site handling

5.1 Fakro Roof Tile Underlays are supplied in rolls and delivered to site individually wrapped in polythene. A technical leaflet bearing the product name is included with each roll and the BBA identification mark incorporating the number of this Certificate is shown on the leaflet.

5.2 Rolls should be stored flat or on end on a clean, level surface and kept under cover.

Design Data

6 Weathertightness



6.1 Tests indicate that Fakro Roof Tile Underlays 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.

6.2 The product resists penetration of liquid water to a head, and consequently may be used as temporary waterproofing prior to the installation of slates or tiles. The period of such use should, however, be kept to a minimum.

7 Properties in relation to fire

7.1 The product has similar properties in relation to those of traditional polyethylene.

7.2 When the product is used in a fully supported situation, the reaction to fire will be determined by the support.

7.3 When used unsupported, 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 sarking material, care should be taken during building and maintenance to avoid the material becoming ignited.

8 Maintenance

Damage to the underlay can be repaired easily prior to the installation of slates or tiles by replacement of the damaged sheet or for limited areas, by patching and sealing correctly. Care should be taken to ensure that the weathertightness of the roof is maintained.

9 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 it is not exposed in sunlight for long periods (see section 6.5 of the accompanying Detail Sheets). Advice regarding exposure can be obtained from the Certificate holder.

Bibliography

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

Conditions of Certification

10 Conditions

10.1 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.

10.2 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.

10.3 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.

10.4 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 or 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.

10.5 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 or in the future; nor is conformity with such information 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 manufacture, supply, installation, use and maintenance of this product/system.



In the opinion of the British Board of Agrément, Fakro Roof Tile Underlays are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 05/4292 is accordingly awarded to Fakro (GB) Ltd.

On behalf of the British Board of Agrément

Date of Second issue: 8th August 2006

Chief Executive

**Original Certificate issued on 22 December 2005. This amended version includes reference to revised national Building Regulations, inclusion of cold non-ventilated application and new Conditions of Certification.*



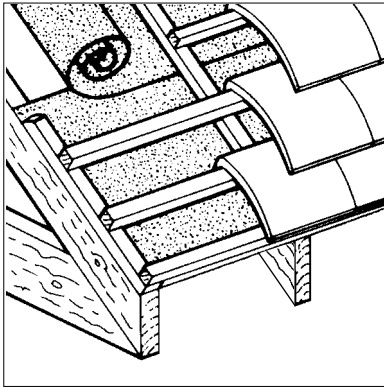
Fakro (GB) Ltd

EUROTOP N35 ROOF TILE UNDERLAY FOR USE IN NON-VENTILATED COLD PITCHED ROOF SYSTEM

Certificate No 05/4292

DETAIL SHEET 3

Product



- THIS DETAIL SHEET RELATES TO EUROTOP N35 ROOF TILE UNDERLAY FOR USE IN NON-VENTILATED COLD PITCHED ROOF SYSTEM.

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

Technical Specification

1 Description

1.1 Eurotop N35 Roof Tile Underlay is manufactured by lamination of a water vapour permeable film between two layers of non-woven polypropylene spun bond to form a flexible sheet for unsupported and fully supported specifications.

1.2 The product has the nominal characteristics of:

| | |
|----------------------------|--|
| thickness (mm) | 0.5 |
| weight (gm ⁻²) | 135 |
| roll length (m) | 50 |
| roll width (m) | 1.50 |
| colour | green top surface white under surface |

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:

- weight
- tensile strength and elongation
- head of water.

Design Data

2 General

2.1 Eurotop N35 Roof Tile Underlay is satisfactory for use as an unsupported, vapour permeable roof tile underlay in cold-pitched roofs without conventional ventilation. The product is laid in the traditional manner, parallel to the eaves, and fixed in

accordance with BS 5534 : 2003 to the rafters. The insulation, laid horizontally at ceiling level, is pressed tightly into the eaves against the underlay to ensure no gaps are present. The tiling and slating of the pitched roofs should be constructed in accordance with the relevant clauses of BS 5534 : 2003.

2.2 The product can be installed by draping over rafters and securing with tiling battens, or installed taut over rafters and secured with counter battens and tiling battens.

2.3 The product is satisfactory for use in dwellings with non-ventilated tiled or slated roofs of any conventional plan and of any size. Features⁽¹⁾ successfully assessed include:

- duo-pitched
- mono-pitched
- hipped
- mansard
- gable ends
- verges
- abutments
- valleys
- room in roof
- dormers
- timber sarking⁽²⁾.

(1) For roofs incorporating other features or non-conventional roof geometries or construction materials, the advice of the distributor should be sought.

(2) As Scottish practice, with slates nailed through the breather membrane directly onto timber planks (nominally 150 mm wide with a 2 mm gap) without battens.

2.4 In conventionally-ventilated roof constructions, energy loss by ventilation can account for up to 25% of the total heat lost through the roof. The non-ventilated system will substantially reduce this mechanism of heat loss.

2.5 In non-ventilated roof systems, the risk of condensation is equivalent to, or less than, that attending conventionally-ventilated cold roof systems.

3 Strength

The product will resist the loads associated with installation.

4 Wind loading

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

4.2 Wind loading on the underlay should be calculated in accordance with BS 5534 : 2003, Section 5.5.2.7 (see the *Tests* section of this Detail Sheet for acceptable wind loads with specific batten spacings for the draped product using a 25 mm deep tiling batten).

5 Risk of condensation



5.1 For design purposes, the underlay's resistance to water vapour transmission may be taken as not more than 0.2 MNsg^{-1} . This value can be used in roof designs shown in Section 8.4 of BS 5250 : 2002. For roofs designed in accordance with BS 5534 : 2003, it may be regarded as a type 'LR' membrane.

5.2 The complete roof construction, ceiling boards to roof tiles, must be considered as a total system with regard to condensation risk. It is important that the product is laid in accordance with the Certificate holder's instructions and this Certificate to prevent excessive condensation as defined in the national Building Regulations and Standards thus:

England and Wales

Approved Document C

Scotland

Mandatory Standard 3.15

Northern Ireland

Regulation C5.

5.3 All penetrations into the roof space must be properly sealed and loft hatches made convection tight by, for example, using a compressible draught seal. Vent stacks, boiler flues for example passing through the roof space must additionally be sealed along their length.

5.4 Subsequent penetrations into the roof space must be properly sealed to ensure the integrity of the non-ventilated, cold-pitched roof system is maintained. This can be achieved by the use of butyl adhesive tape.

5.5 It is essential to limit the rate of water vapour transfer into the loft space from the dwelling below. Appropriate measures include:

- the dwelling below the roof must be ventilated in accordance with national Building Regulations and Standards for the dispersal and rapid dilution of water vapour
- extractor fans should be used in rooms that may experience high humidity such as kitchens, utility rooms and bathrooms. The ventilation rates should be in accordance with the guidance documents supporting current national Building Regulations and Standards
- all water tanks in the loft space should be covered and all pipework lagged
- penetrations into the loft space from inside and outside must be sealed. Sealing should also be in accordance with the Certificate holder's instructions
- to allow water vapour to disperse above the product, tiling battens (minimum thickness 25 mm) must be used to ensure an air space between the roof covering and the product (see section 8.2).

5.6 For additional protection, the use of a vapour control layer/vapour check plasterboard can be considered.

Installation

6 General

6.1 Eurotop N35 Roof Tile Underlay must be installed and fixed in accordance with the Certificate holder's instructions, 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.

6.2 The product is installed with the coloured side uppermost and lapped to shed water out and down the slope.

6.3 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 |

6.4 Hips should be covered with a 600 mm wide strip of the product.

6.5 In closed eaves construction, the use of eaves guards is recommended.

7 Procedure

Fully supported (cold roofs)

7.1 The product may be laid over timber plank sarking as described in section 2.3, footnote 2.

Fully supported (warm room-in-roofs)

7.2 The product may be used over sarking boards of softwood, C4 grade chipboard or water-resistant grade plywood, and either continuous insulation or insulation placed between the rafters.

7.3 The product is secured to the support with counter battens at least 12 mm thick to create an air space between the product and the tiles for drainage and vapour dispersal. The counter battens are fixed with corrosion-resistant staples or galvanized clout nails as appropriate. Tiling battens are secured to the counter battens and support with appropriate fixings.

7.4 Care must be taken to minimise the risk of interstitial condensation as described in section 5.5, particularly for timber sarking which may be below the dew-point for extended periods during winter months.

Unsupported

7.5 The membrane, when installed as an unsupported system, is fixed in the traditional method for roof tile underlays, ie draped between the rafters.

8 Finishing

8.1 It is important that the following details are maintained to achieve a convection-tight loft space (see also section 5.5).

- all pipework, electrical fittings, that penetrate the loft space must be sealed
- the loft hatch must be securely sealed to ensure draught-free fit
- the insulation must be pushed into the eaves and against the underlay to avoid gaps.

8.2 The tiling and slating must be carried out in accordance with the relevant clauses of BS 5534 : 2003 and the manufacturer's instructions, especially when using tightly jointed slates or tiles.

Technical Investigations

The following is a summary of the technical investigations carried out on Eurotop N35 Roof Tile Underlay.

9 Tests

Samples of the product were obtained from the company for testing. The result of the tests carried out by, or on behalf of, the BBA, which show typical results for the material, are summarised in Tables 2 to 4.

Table 2 Physical properties

| Test (units) | Method ⁽¹⁾ | Mean result |
|--|-----------------------|-------------|
| Mullen burst strength (kNm ⁻²) | BS 3137 | 524 |
| Head of water (mm) | BS EN 20811 | 5540 |

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

Table 3 Physical properties — directional

| Test (units) | Method ⁽¹⁾ | Mean result |
|---------------------------------------|-----------------------|-------------|
| Tensile strength (N per 50 mm) unaged | EN 12311-1 | |
| long ⁽²⁾ | | 274 |
| trans ⁽³⁾ | | 168 |
| UVA/heat ageing ⁽⁴⁾ | | |
| long ⁽²⁾ | | 209 |
| trans ⁽³⁾ | | 139 |
| Wet strength ⁽⁵⁾ | | |
| long ⁽²⁾ | | 288 |
| trans ⁽³⁾ | | 177 |
| Elongation at break (%) unaged | EN 12311-1 | |
| long ⁽²⁾ | | 44 |
| trans ⁽³⁾ | | 69 |
| UVA/heat ageing ⁽⁴⁾ | | |
| long ⁽²⁾ | | 24 |
| trans ⁽³⁾ | | 52 |
| wet strength ⁽⁵⁾ | | |
| long ⁽²⁾ | | 44 |
| trans ⁽³⁾ | | 69 |
| Tear resistance (nail) (N) unaged | BS EN 12310-1 | |
| long ⁽²⁾ | | 121 |
| trans ⁽³⁾ | | 123 |

(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) UV/heat aged at 50°C UVA/heat ageing for 90 days at 70°C ±2.

(5) Wet strength soak at 23°C for 24 h — tested surface wet.

Table 4 Service performance

| Test (units) | Method ⁽¹⁾ | Mean result |
|--|-----------------------|--|
| Water vapour permeability at 25°C/75% RH ($\text{gm}^{-2}\text{day}^{-1}$) | BS 3177 | 1527 |
| Vapour resistance (MNsg^{-1}) | BS 3177 | 0.14 |
| Dimensional stability long ⁽²⁾ trans ⁽³⁾ | BS EN 1107-2 | -1.43 +0.35 |
| Slip resistance (coefficient of friction) dry wet | T1/10 ⁽⁴⁾ | 0.75 0.56 |
| Resistance to water penetration unaged UV heat aged ⁽⁵⁾ | EN 1928 | pass pass |
| Resistance to streaming water unsupported supported | MOAT 69 : 4.2.2 | pass pass |
| Resistance to wind loads batten spacing 350 mm batten spacing 330 mm batten spacing 300 mm batten spacing 250 mm | MOAT 69 : 4.2.1 | 0.5 ⁽⁶⁾ 1.0 ⁽⁶⁾ 1.0 ⁽⁶⁾ 2.5 ⁽⁶⁾ |

- (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) BBA Test Method.
 (5) UV/heat aged at 50°C UVA/heat ageing for 90°C at 70°C ± 2.
 (6) Maximum pressure achieved.

10 Investigations

10.1 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.

10.2 Using computer modelling, roofs described in section 2.3 were analysed for the risk of condensation.

Bibliography

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 1107-2 : 2001 *Flexible sheets for waterproofing — 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 20811 : 1992 *Textiles. Determination of resistance to water penetration. Hydrostatic pressure test*

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

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

MOAT No 69 : 2004 *UEAtc Technical Report for the Assessment of Discontinuous Roofing Underlay Systems*



On behalf of the British Board of Agrément

Date of issue: 8th August 2006

Chief Executive