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Agrément Certificate

22/6441

Product Sheet 2

MANTHORPE 120

FOR USE IN COLD NON-VENTILATED ROOFS

This Agrément Certificate Product Sheet(1) relates to Manthorpe 120, flexible three-layer polypropylene underlays for use in cold non-ventilated pitched roof systems.

(1) Hereinafter referred to as 'Certificate'.

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-driven snow and dust into the interior of a building (see section 6).

Condensation — the product is a low water vapour resistance (Type LR) underlay and can be used as part of a cold non-ventilated roof system (see section 7).

Wind loading — when installed on appropriately spaced battens and/or rafters, the product's physical properties are 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 8).

Strength — the product has adequate strength to resist the loads associated with the installation of the roof (see section 9).

Properties in relation to fire — the product is classified as Class E in accordance with UNE EN 13501-1 : 2019 and its use is restricted in some cases by the national Building Regulations (see section 10).

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 12).

The BBA has awarded this 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

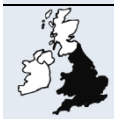
Hardy Giesler
Chief Executive Officer

Date of First issue: 1 November 2022

Originally certificated on 3 September 2013

Regulations

In the opinion of the BBA, Manthorpe 120 for use in cold non-ventilated roofs, 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 presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	**B3(4)**	**Internal fire spread**
Comment:		The product is restricted by this Requirement. See section 10.1 of this Certificate.
Requirement:	**B4(1)**	**External fire spread**
Comment:		The product is restricted by this Requirement in some circumstances. See sections 10.1 and 10.2 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The product will contribute to a roof satisfying this Requirement. See section 6.1 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The product will contribute to a roof satisfying this Requirement. See section 7 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The product is acceptable. See section 12 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)**	**Fitness and durability of materials and workmanship**
Comment:		The product can contribute to a roof satisfying this Regulation. See section 12 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	2.4	Cavities
Comment:		The product can contribute to a roof satisfying this Standard with respect to clause 2.4.2[(1)(2)]. See section 10.1 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The product is restricted under clauses 2.6.4[(1)(2)], 2.6.5[(1)] and 2.6.6[(2)] of this Standard, in some circumstances. See sections 10.1 and 10.3 of this Certificate.
Standard:	2.7	Spread on external walls
Comment:		The product is restricted under clause 2.7.1[(1)(2)] of this Standard. See sections 10.1 and 10.3 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The product will contribute to a roof satisfying clauses 3.10.1[(1)(2)] and 3.10.8[(1)(2)] of this Standard. See section 6.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can contribute to limiting the risk of interstitial condensation, with reference to clauses 3.15.1[(1)(2)], 3.15.3[(1)(2)] and 3.15.7[(1)(2)]. See section 7 of this Certificate.

Standard:	7.1(a)	Statement of sustainability
Comment:		The product 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 product 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 product is acceptable. See section 12 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The product will contribute to a roof satisfying this Regulation. See section 6.1 of this Certificate.
Regulation:	**29**	**Condensation**
Comment:		The product will contribute to a roof satisfying this Regulation. See section 7 of this Certificate.
Regulation:	**35(4)**	**Internal fire spread - structure**
Comment:		The product can contribute to satisfying this Regulation. See section 10.1 of this Certificate.
Regulation:	**36(a)**	**External fire spread - structure**
Comment:		The product is restricted by this Regulation in some circumstances. See sections 10.1 and 10.2 of this 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.

See sections: 1 *Description* (1.1) and 10 *Properties in relation to fire* (10.4) of this Certificate.

Additional Information

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13859-1 : 2014.

Technical Specification

1 Description

Manthorpe 120 for use in cold non-ventilated roofs are three-layer polypropylene composites with the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Value
Thickness (mm)	0.55
Mass per unit area ($g \cdot m^{-2}$)	120
Roll length (m)	50
Roll width (m)	1
Colour	
upper	Grey
lower	White
Tensile strength (N per 50 mm)	
longitudinal	245
transverse	175
Elongation (%)	
longitudinal	50
transverse	60
Tear resistance (N)	
longitudinal	130
transverse	140
Resistance to penetration of air ($m^3 \cdot m^2 \cdot h^{-1}$ @50 Pa)	0.050
Watertightness	
unaged	W1
aged(1)	W1
Equivalent air layer thickness S_d (m)	0.02

(1) Aged in accordance with BS EN 13859-1 : 2014, Annex C.

2 Manufacture

2.1 The membranes are manufactured by an ultrasonic-bonding/thermal bonding process in which a polypropylene breathable film is bonded with non-woven polypropylene membranes to form a flexible sheet.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control being operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 Rolls are delivered to site in packages that carry a label bearing the Certificate holder's name, the grade identification and the BBA logo incorporating the number of this Certificate.

3.2 The rolls should be stored flat on their sides, on a smooth, clean, dry surface, under cover and protected from sunlight.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Manthorpe 120 for use in cold non-ventilated roofs.

Design Considerations

4 Use

4.1 The product is satisfactory for use as permeable roof tile underlays in dwellings with cold non-ventilated tiled and slated pitched roofs of any conventional plan and size. Features(1) successfully assessed include:

- duo pitched
- verges
- timber planks(3)(4)(5)
- gable ends
- dormers
- mansard
- room-in-roof(2)
- hipped
- valleys.
- mono-pitched
- abutments

(1) For roofs incorporating other features, or unconventional roof geometries or construction materials, the advice of the Certificate holder should be sought.
(2) Where a room-in-roof results in part of a pitch being insulated (ie a warm roof), design and detailing of that part of the roof should comply with the relevant guidance given in Product Sheet 1 of this Certificate.
(3) Timber sarking planks, Scottish practice: the membrane is laid over open jointed timber planks (nominally 150 mm wide with a 2 mm gap) and fixed with galvanized clout nails. Slates are nailed through the membrane on the sarking without battens.
(4) Timber sarking, tiled roofs: counter battens of 12 mm minimum thickness should be used to provide a drainage path beneath the tiling battens. The membrane may be laid directly over the timber planks or draped over the counter battens.
(5) Sheet sarking materials should not be used.

4.2 It is important that the designers, planners, contractors and/or installers ensure that the roof and ceiling are constructed in accordance with the Certificate holder's instructions and the information given in this Certificate.

4.3 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.

4.4 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 significantly reduce this heat loss.

4.5 In cold non-ventilated roof systems, the risk of condensation is equivalent to, or less than, that of conventionally ventilated cold roof systems (see section 7).

5 Practicability of installation

The product is designed to be installed by competent slaters/tilers experienced with this type of product.

6 Weathertightness

6.1 The product is Class W1 in accordance with BS EN 13859-1 : 2014 and will resist the passage of water, wind-driven 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 : 2014.

6.2 The product resists penetration of liquid water 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. Further information is given in BBA Information Bulletin 2 *Permeable Roof Tile Underlay – Guide to Good Site Practice.*

7 Condensation

7.1 For design purposes, the product's water vapour resistance may be taken as not more than 0.25 $MN \cdot s \cdot g^{-1}$ and for roofs designed in accordance with BS 5534 : 2014 or BS 5250 : 2021, it may be regarded as a Type LR underlay.

7.2 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 minimise the risk of condensation.

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

Drying-out Period.

7.4 All penetrations into and out of the roof space must be properly sealed in accordance with the Certificate holder's instructions. In addition, such features as vent stacks and boiler flues passing through the roof space must be sealed.

7.5 It is essential to minimise water vapour transfer into the loft space from the dwelling below. Appropriate measures include:

- ventilating the dwelling below in accordance with national Building Regulations and Standards for the dispersal and rapid dilution of water vapour, particularly from rooms that may experience high humidity (such as kitchens, utility rooms and bathrooms)
- covering all water tanks in the loft space and lagging pipework
- sealing penetrations in the ceiling and making loft hatches convection-tight by using a compressible draught seal
- ensuring that there is continuity of jointing with walls (and behind wall linings) at ceiling perimeters
- ensuring that masonry wall cavities do not interconnect with roof cavities.

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

8 Wind loading

8.1 Project design wind speeds for the roof in which the product is installed should be determined, and wind uplift forces calculated, by a suitably experienced and competent individual in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex.

Unsupported

8.2 The product is satisfactory for use in unsupported systems in the geographical Wind Zones given in Table 2, where a well-sealed ceiling as defined in BS 9250 : 2007, Clause 3.7, is present and the roof has a ridge height ≤15 m, a pitch between 12.5 and 75°, and a site altitude ≤100 m, and where topography is not significant. For all other cases, the required uplift resistance should be determined using BS 5534 : 2014 and the Certificate holder's declared wind uplift resistances in Table 3.

Table 2 Zones of applicability of Manthorpe 120 with battened laps and integral laps, according to BS 5534 : 2014, clause A.8

Product	≤345 mm batten gauge with battened laps	≤250 mm batten gauge with battened laps
Manthorpe 120	Zones 1 to 3	Zones 1 to 5

Table 3 Declared wind uplift resistance (Pa)

Product	≤345 mm batten gauge with battened laps(2)	≤250 mm batten gauge with battened laps(1)(2)
Manthorpe 120	1196	2501

(1) Underlays with a wind uplift resistance at a 250 mm batten gauge that satisfy the minimum design wind pressure of 820 Pa for Zone 1 are deemed to satisfy the requirements for use at 100 mm batten gauge in all Wind Zones.
(2) Mean of test results.

8.3 Timber sarking, such as square-edged butt jointed planks, are not considered to be airtight and the underlay is treated as unsupported.

9 Strength

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

10 Properties in relation to fire

10.1 The product is classified as Class E in accordance with UNE EN 13501-1 : 2019.

10.2 In England, Wales and Northern Ireland, the product, when used in pitches of greater than 70°, should not be used on buildings that have a storey at least 18 m above ground level and which contain one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house), student accommodation, care homes, sheltered housing, hospitals or dormitories in boarding schools, and additionally in Northern Ireland, nursing homes and places of lawful detention.

10.3 In Scotland, the product, when used in pitches greater than 70°, excluding upstands, should not be used on domestic or shared residential buildings that have a storey more than 11 m above ground level or are less than 1 m from a boundary.

10.4 When the product is used unsupported, 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 being ignited.

10.5 When the product is used with timber sarking, such as square-edged butt jointed planks, the reaction to fire will be primarily determined by the sarking.

11 Maintenance

As the product is confined within a roof structure and has suitable durability (see section 12), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 17).

12 Durability

The product will be virtually unaffected by the normal conditions found in a roof space and will have a service life comparable with that of a traditional roof tile underlay, provided it is not exposed to sunlight for long periods (see section 14.5). Advice regarding exposure can be obtained from the Certificate holder.

13 Reuse and recyclability

The product contains polypropylene, which can be recycled.

Installation

14 General

14.1 The product must be installed and fixed in accordance with the Certificate holder's instructions, the provisions of this Certificate and the relevant recommendations of BS 5534 : 2014, BS 8000-0 : 2014 and BS 8000-6 : 2013. Installation can be carried out under all conditions normal to roofing work.

14.2 The product has a high coefficient of friction, either wet or dry, giving a slip-resistant surface for increased safety during the installation of the tiles or slates.

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

14.4 Overlaps must be provided with the minimum dimensions given in Table 4. It is recommended that vertical joints in the membrane are avoided. Where required, any possible vertical laps should be completed carefully and made watertight. Unsupported details should be overlapped by at least one full rafter bay, with the end of the lower lap fully secured to the rafter across its width. Avoid placing vertical joins over the same rafter bay on consecutive courses.

Table 4 Minimum overlaps in not fully supported specifications

Roof pitch (°)(1)	Horizontal lap (mm)	Vertical lap (mm)
12.5 ≤15	225	150
≤22	200	150
>22	150	150

(1) In all cases the minimum pitch for the slate or tile being used should be considered. Where variations occur, advice should be sought from the Certificate holder.

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

15 Procedure

Draped and loose laps

15.1 The product can be installed as part of an unsupported system, and fixed in the traditional method for roof tile underlays, ie draped between the rafters, with the coloured printed side uppermost.

Taut

15.2 The product should be laid horizontally and must be pulled taut and not allowed to drape. Each sheet should be fixed to hold it in position prior to the counter battens being fixed. Counter battens (minimum thickness 25 mm) are then fixed to the rafter.

Timber sarking planks

15.3 For fully supported roofs (traditional Scottish practice), the slates can be nailed through the product into the timber sarking planks, normally 150 mm wide with a 2 mm gap. The underlay must be fixed to the planks using galvanized clout nails.

15.4 For fully supported roofs (where battens are used) counter battens of minimum thickness 12 mm should be installed either above or beneath the underlay for drainage purposes.

16 Finishing

16.1 Detailing of abutments, verges and hips must be in accordance with the Certificate holder's instructions.

16.2 To minimise the risk of condensation, it is important that the details stated in sections 7.3, 7.5 and 7.6 are maintained.

16.3 Tiling and slating must be carried out in accordance with the relevant clauses of BS 5534 : 2014, BS 8000-0 : 2014 and BS 8000-6 : 2013 and the Certificate holder's instructions, especially when using tightly jointed slates or tiles, ie where a ventilated batten space should be provided.

17 Repair

Damage to the product can be repaired 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

18 Tests

18.1 An assessment was made of data to BS EN 13859-1 : 2014 in relation to:

- dimensions
- mass per unit area
- tensile strength and elongation

- resistance to tear
- dimensional stability
- resistance to penetration of air
- resistance to water penetration
- resistance to artificial ageing
- reaction to fire
- water vapour transmission
- watertightness of seams.

18.2 Tests were carried out to determine:

- slip resistance
- resistance to streaming water
- Mullen burst strength
- resistance to wind loads

in order to assess:

- safety during installation
- performance under typical service conditions
- robustness during installation
- properties when installed.

19 Investigations

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

19.2 Using computer modelling, cold non-ventilated roofs were analysed for risk of condensation.

Bibliography

BS 5250 : 2021 *Management of moisture in buildings — Code of practice*

BS 5534 : 2014 + A2 : 2018 *Slating and tiling for pitched roofs and vertical cladding — Code of practice*

BS 8000-0 : 2014 *Workmanship on construction sites – Introduction and general principles*
BS 8000-6 : 2013 *Workmanship on building sites — Code of practice for slating and tiling of roofs and walls*

BS 9250 : 2007 *Code of practice for design of the airtightness of ceilings in pitched roofs.*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions*
NA to BS EN 1991-1-4 : 2005 + A1 : 2010 *UK National Annex to Eurocode 1 — Actions on structures — General actions*

BS EN 13859-1 : 2014 *Flexible sheets for waterproofing — Definitions and characteristics of underlays — Underlays for discontinuous roofing*

UNE EN 13501-1 : 2019 *Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests*

20 Conditions

20.1 This Certificate:

- relates only to the product/system 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.

20.2 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.

20.3 This Certificate will remain valid for an unlimited period provided that the product/system 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.

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

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

20.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal 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, 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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