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Agrément Certificate

07/4444

Product Sheet 9 Issue 2

MANNOK INSULATION

MANNOK ISOSHIELD – FULL FILL CAVITY WALL INSULATION

This Agrément Certificate Product Sheet⁽¹⁾ relates to Mannok IsoShield – Full Fill Cavity Wall Insulation, comprising a rigid polyisocyanurate (PIR) board with a foil-facing on both sides. The product is for use as full fill thermal insulation in new external masonry cavity walls up to 25 m in height in domestic and non-domestic buildings; additional requirements apply for buildings above 12 m in height and further restrictions may apply based on the reaction to fire performance.

(1) Hereinafter referred to as 'Certificate'.

The assessment includes

Product factors:

- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

Ongoing contractual Scheme elements†:

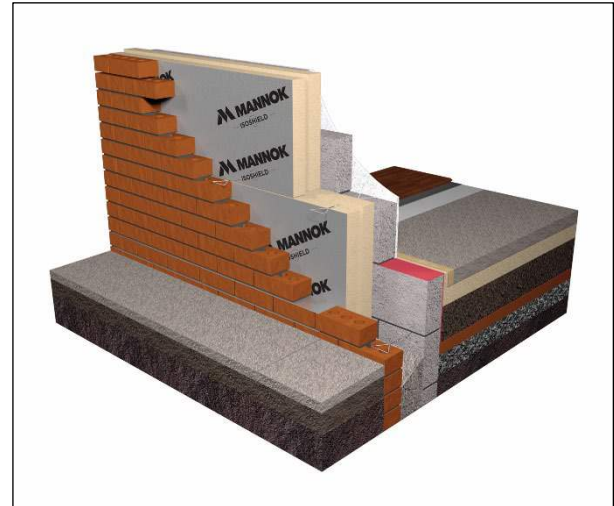
- regular assessment of production
- formal 3-yearly review

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

Date of Second issue: 10 January 2024

Originally certificated on 27 February 2017



KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

Hardy Giesler
Chief Executive Officer

This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.

The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).

Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that Mannok IsoShield – Full Fill Cavity Wall Insulation, 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 Building Regulations 2010 (England and Wales) (as amended)

Requirement:	B3(4)	Internal fire spread (structure)
Comment:		The product can contribute to satisfying this Requirement. See section 2 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		The product is restricted by this Requirement in some cases. See section 2 of this Certificate.
Requirement:	C2(a)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See section 3 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See section 3 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See section 3 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product can contribute to satisfying this Requirement, however, compensating fabric measures may be required. See section 6 of this Certificate.
Regulation:	7(1)	Materials and workmanship
Comment:		The product is acceptable. See sections 8 and 9 of this Certificate.
Regulation:	7(2)	Materials and workmanship
Comment:		The product is restricted by this Regulation. See section 2 of this Certificate.
Regulation:	25B	Nearly zero-energy requirements for new buildings
Regulation:	26	CO₂ emission rates for new buildings
Regulation:	26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Regulation:	26A	Primary energy rates for new buildings (applicable to Wales only)
Regulation:	26B	Fabric performance values for new dwellings (applicable to Wales only)
Regulation:	26C	Target primary energy rates for new buildings (applicable to England only)
Regulation:	26C	Energy efficiency rating (applicable to Wales only)
Comment:		The product can contribute to satisfying these Regulations; however, compensating fabric/services measures may be required. See section 6 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The product is acceptable. See sections 8 and 9 of this Certificate.
Regulation:	8(3)	Fitness and durability of materials and workmanship
Comment:		The product is restricted by this Regulation. See section 2 of this Certificate.
Regulation:	9	Building standards - construction
Standard:	2.6	Spread to neighbouring buildings
Comment:		The product is restricted by this Standard in some cases, with reference to clauses 2.6.5 ⁽¹⁾ and 2.6.6 ⁽²⁾ . See section 2 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.4.1 ⁽¹⁾⁽²⁾ and 3.4.5 ⁽¹⁾⁽²⁾ . See section 3 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.3 ⁽¹⁾⁽²⁾ . See section 9 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ and 3.15.5 ⁽¹⁾⁽²⁾ . See section 3 of this Certificate.
Standard:	6.1(b)(c)	Energy demand and carbon dioxide emissions
Comment:	(d)	The product can contribute to satisfying this Standard with reference to clauses 6.1.1 ⁽¹⁾ , 6.1.2 ⁽²⁾ and 6.1.6 ⁽¹⁾ ; however, compensating fabric/services measures may be required. See section 6 of this Certificate.
Standard:	6.2	Building insulation envelope
Comment:		The product can contribute to satisfying this Standard with reference to clauses 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.9 ⁽¹⁾ , 6.2.10 ⁽¹⁾ , 6.2.11 ⁽¹⁾⁽²⁾ and 6.2.13 ⁽²⁾ ; however, compensating fabric measures may be required. See section 6 of this Certificate.
Standard:	7.1(a)(b)	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 at least a bronze level of sustainability as defined in this Standard. In addition, the product can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 ⁽¹⁾⁽²⁾ , 7.1.6 ⁽¹⁾⁽²⁾ and 7.1.7 ⁽¹⁾⁽²⁾ . See section 6 of this Certificate.
Regulation:	12	Building standards - conversions
Comment:		All comments given for 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)	Fitness of materials and workmanship
Comment:	(iii)(b)(i)(ii)	The product is acceptable. See sections 8 and 9 of this Certificate.

Regulation:	23(2)	Fitness of materials and workmanship
Comment:		The product is restricted by this Regulation. See section 2 of this Certificate.
Regulation:	28(a)	Resistance to moisture and weather
Comment:		The product can contribute to satisfying this Regulation. See section 3 of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The product can contribute to satisfying this Regulation. See section 3 of this Certificate.
Regulation:	29	Condensation
Comment:		The product can contribute to satisfying this Regulation. See section 3 of this Certificate.
Regulation:	35(4)	Internal fire spread - structure
Comment:		The product can contribute to satisfying this Regulation. See section 2 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The product is restricted by this Regulation in some cases. See section 2 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Comment:		The product can contribute to satisfying this Regulation, however, compensating fabric measures may be required. See section 6 of this Certificate.
Regulation:	40(2)	Target carbon dioxide emission rate
Regulation:	43B	Nearly zero-energy requirements for new buildings
Comment:		The product can contribute to satisfying these Regulations, however, compensating fabric/services measures may be required. See section 6 of this Certificate.

Additional Information

NHBC Standards 2024

In the opinion of the BBA, Mannok IsoShield – Full Fill Cavity Wall Insulation, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 6.1 *External masonry walls*.

Fulfilment of Requirements

The BBA has judged Mannok IsoShield – Full Fill Cavity Wall Insulation to be satisfactory for use as described in this Certificate. The product has been assessed as full fill cavity wall insulation in new external masonry cavity walls up to 25 m in height in domestic and non-domestic buildings; additional requirements apply for buildings above 12 m in height and further restrictions may apply based on the reaction to fire performance.

ASSESSMENT

Product description and intended use

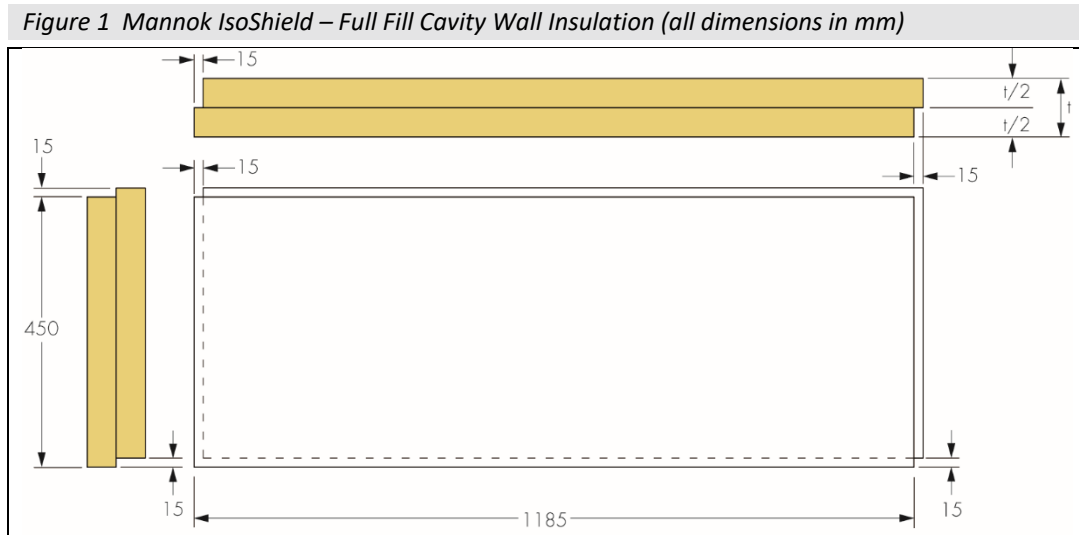
The Certificate holder provided the following description for the product under assessment. Mannok IsoShield – Full Fill Cavity Wall Insulation consists of a rigid PIR foam board with composite foil-facings.

The product has the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Value
Board size (mm)	1185 x 450
Thickness (mm)	72, 97, 122 and 147
Edge profile	Rebated
Facings	Stucco embossed aluminium foil-facing both sides (printed on one side only)

Each board incorporates rebated edging on all four sides, enabling the boards to interlock when installed (see Figure 1).



Ancillary Items

The Certificate holder recommends the following ancillary items for use with the product, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- cavity wall ties with insulation-retaining fixings to BS EN 845-1 : 2013
- damp-proof course (DPC) at wall corners (see Figures 6 and 7).

Application

The product is intended for use as full fill cavity wall insulation in external cavity walls with masonry inner and outer leaves (where masonry includes clay and calcium silicate bricks, concrete blocks, and natural and reconstituted stone blocks).

Where use of the product is not restricted by its reaction to fire classification (see section 2 of this Certificate) additional requirements apply above 12 m in height (see section 9.1.7 of this Certificate).

Product assessment – key factors

The product was assessed for the following key factors, and the outcome of the assessments is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

1 Mechanical resistance and stability

Not applicable.

2 Safety in case of fire

Data were assessed for the following characteristics.

2.1 Reaction to fire

2.1.1 The product was tested for reaction to fire and the classification is given in Table 2.

Table 2 Reaction to fire classification

Product assessed	Assessment method	Requirement	Result
Mannok IsoShield - Full Fill Cavity Wall Insulation	UNE EN 13501-1 : 2019	Value achieved	E ⁽¹⁾

(1) Applus+ Laboratories report 21/32304505-2 M3, 19 December 2022. Copies are available from the Certificate holder on request.

2.1.2 On the basis of data assessed, the product will be restricted in use in some cases, under the documents supporting the national Building Regulations.

2.1.3 In England, Wales and Northern Ireland, the product must not be used on buildings with a storey 18 m or more above ground level which contain one or more dwellings, an institution, a room for residential purposes (excluding any room in a hostel, hotel or boarding house in Wales and Northern Ireland only), student accommodation, care homes, sheltered housing, hospitals or dormitories in boarding schools and, additionally in Northern Ireland, nursing homes and places of lawful detention.

2.1.4 In England, Wales and Northern Ireland, the product is unrestricted in terms of proximity to a relevant boundary and, for constructions comprising two leaves of brick or concrete each at least 75 mm thick, and with cavities closed around openings and at the top of the wall (with cavity barriers in Northern Ireland), is unrestricted in terms of height, other than those described in section 2.1.3.

2.1.5 In England, Wales and Northern Ireland, for constructions other than those described in sections 2.1.3 or 2.1.4, the product must not be used on buildings with a floor more than 18 m above ground level, or in England only, it must not be used on residential buildings with a storey 11 m or more in height.

2.1.6 In Scotland, the product must not be used on buildings that have a storey 11 m or more above ground level and contain; a dwelling, a building used as a place of assembly, or as a place of entertainment or recreation, a hospital, a residential care building or sheltered housing complex or a shared multi-occupancy residential building.

2.1.7 In Scotland, the product may be used without restriction on height or proximity to a relevant boundary, other than buildings described in section 2.1.6, provided it is installed in a cavity that is between two leaves of masonry at least 75 mm thick, and which has a cavity barrier around all openings in the wall and at the top of the wall head. For other constructions, the product must not be used on buildings with a storey at a height of 11 m or more above the ground or within 1 m of a relevant boundary.

2.1.8 Designers must refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance, cavity closers and barriers, fire stopping of service penetrations and combustibility limitations for other materials and components used in the overall wall construction.

3 Hygiene, health and the environment

Data were assessed for the following characteristics.

3.1 Effectiveness against rising damp

3.1.1 The product was tested for short term water absorption by partial immersion and the results are given in Table 3.

Table 3 Short term water absorption by partial immersion

Product assessed	Assessment method	Requirement	Result
Mannok IsoShield - Full Fill Cavity Wall Insulation	BS EN 1609 : 2013	$\leq 1.25 \text{ kg}\cdot\text{m}^{-2}$	Pass

3.1.2 The product may be used in situations where it bridges the DPC in walls; dampness from the ground will not pass through to the inner leaf provided the wall is detailed in accordance with the requirements and provisions of the national Building Regulations.

3.2 Weathertightness

3.2.1 A rain penetration test was carried out and the results are given in Table 4.

Table 4 Rain penetration test

Product assessed	Assessment method	Requirement	Result
Mannok IsoShield - Full Fill Cavity Wall Insulation	BBA wet wall test method	No water transfer to inner skin	Pass

3.2.2 On the basis of the data assessed, constructions incorporating the product, and built in accordance with the Standards and requirements listed in section 9 of this Certificate, will resist the transfer of precipitation to the inner leaf and satisfy the requirements of the national Building Regulations.

3.3 Water vapour permeability

For the purposes of assessing the risk of interstitial condensation, the water vapour resistance/resistivity values may be taken as given in Table 5.

Table 5 Water vapour resistance/resistivity

Material	Assessment method	Requirement	Result
PIR insulation	BS EN ISO 10456 : 2007	Declared value	$300 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$
Composite foil facer	BS 5250 : 2021		$1000 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$

4 Safety and accessibility in use

Not applicable.

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

Data were assessed for the following characteristics.

6.1 Thermal conductivity

6.1.1 The product was tested for thermal conductivity and the result is given in Table 6.

Table 6 Thermal conductivity

Product assessed	Insulation thickness	Assessment method	Requirement	Result
Mannok IsoShield - Full Fill Cavity Wall Insulation	72, 97, 122 and 147 mm	Thermal conductivity to BS EN 13165 : 2012	Declared value (λ_D)	$0.022 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$

6.2 Conservation of fuel and power

6.2.1 Example U-values are given in Table 7.

Table 7 Example U-values⁽¹⁾ – full fill insulation

U-value (W·m ⁻² ·K ⁻¹)	Mannok IsoShield - Full Fill Cavity Wall Insulation Board Thickness of insulation (mm) ⁽²⁾	
	13 mm dense plaster 100 mm dense block ⁽³⁾	Plasterboard on dabs 100 mm AAC block ⁽⁴⁾
0.13	-(5)	147
0.15	147	122
0.17	122	122
0.18	122	97
0.21	97	97
0.26	97	72
0.28	72	72
0.30	72	72

(1) The U value calculations are based on the following:

- wall ties: stainless steel ($\lambda = 17 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), 2.5 per m², 12.5 mm² cross-section
- 102.5 mm brick ($\lambda = 0.77 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$)
- 3 mm residual cavity assumed fully filled with mortar squeeze, $\lambda = 0.94 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.

(2) Nearest available thickness.

(3) 100 mm dense block ($\lambda = 1.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) bridged by mortar (6.6%, $\lambda = 0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) and 13 mm dense plaster ($\lambda = 0.57 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$)

(4) 100 mm AAC block ($\lambda = 0.12 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) bridged by mortar (6.6%, $\lambda = 0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) and 12.5 mm plasterboard ($\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) on 15 mm dabs (20%, $\lambda = 0.43 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).

(5) See section 6.2.3.

6.2.2 The product can contribute towards a construction satisfying the national Building Regulations in respect of energy economy and heat retention.

6.2.3 For improved energy or carbon savings, designers must consider appropriate fabric and/or services measures.

7 Sustainable use of natural resources

Not applicable.

8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in the product were assessed.

8.2 Specific test data were assessed as given in Table 8:

Table 8 Dimensional stability

Product assessed	Assessment method	Requirement	Result
Mannok Therm Flat	Dimensional stability to	Declared value	DS(70,90)4
Mannok IsoShield - Full Fill Cavity Wall Insulation	BS EN 1604 : 2013(70°C and 90-100 % RH for 48 hours)		
	Dimensional stability to		
	BS EN 1604 : 2013 (-20°C for 48 hours)		DS(-20,-)2

8.3 Service life

Under normal service conditions, the product will have a life equivalent to the structure in which it is incorporated, provided it is designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

Information provided by the Certificate holder was assessed for the following factors:

9 Design, installation, workmanship and maintenance

9.1 Design

9.1.1 The design process was assessed, and the following requirements apply in order to satisfy the performance assessed in this Certificate.

9.1.2 External masonry cavity walls must be designed and constructed in accordance with the relevant recommendations of:

- BS 5250 : 2021
- BS 8000-3 : 2001
- BS EN 845-1 : 2013
- BS EN 1996-1-1 : 2005 and its UK National Annex
- BS EN 1996-1-2 : 2005 and its UK National Annex
- BS EN 1996-2 : 2006 and its UK National Annex
- BS EN 1996-3 : 2006 and its UK National Annex.

9.1.3 As with other forms of cavity wall insulation, where buildings need to comply with the *NHBC Standards 2023*, specifiers must observe the requirements of that document.

9.1.4 Cavity wall ties with insulation-retaining fixings and, if required, any additional ties to BS EN 845-1 : 2013 must be used for structural stability in accordance with BS EN 1996-1-1 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006, and their UK National Annexes.

9.1.5 Care must be taken in the overall design and construction of walls incorporating the product to ensure the provision of appropriate:

- cavity trays and DPCs
- cavity barriers
- resistance to the ingress of precipitation, moisture and dangerous gases from the ground
- resistance to sound transmission when flanking separating walls and floors.

9.1.6 The following design conditions must be ensured:

- the insulation completely fills the cavity
- the insulation thickness remains constant where possible. Should any change in vertical thickness occur, a horizontal damp-proof cavity tray should separate each thickness change
- a minimum thickness of 50 mm is maintained where possible. Where, for structural reasons, the insulation thickness is reduced, eg, by the intrusion of ring beams, a minimum thickness of 25 mm insulation should be maintained and the manufacturer's advice on fixing and weatherproofing sought.

9.1.7 Where the walls of a building are between 12 and 25 m high, the following requirements also apply (see also Section 2 of this Certificate):

- from ground level, the maximum height of continuous cavity walls must not exceed 12 m; above 12 m, the maximum height of continuous cavity walls must not exceed 7 m. In both cases, breaks should be in the form of continuous horizontal cavity trays and weepholes discharging to the outside
- the area to be insulated must not be in an infill panel in a framed structure
- the Certificate holder, in association with the architect, must carry out a detailed programme of assessment of the project, including an examination of the quality of installation as work progresses. Above average site supervision is recommended during installation.

9.1.8 Provided that external masonry cavity walls are designed and constructed to incorporate the precautions in this Certificate to prevent moisture penetration, the product will resist the transfer of precipitation to the inner leaf.

9.1.9 Window and door opening reveals must be constructed incorporating a cavity barrier/closer/DPC, as required.

9.1.10 The detailed provisions given in the documents supporting the national Building Regulations when the product is installed in close proximity to certain flue pipes and/or heat-producing appliances must be followed.

9.1.11 Calculations of the thermal transmittance (U-value) of a wall must be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2019.

9.1.12 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.

Interstitial condensation

9.1.13 Walls will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2021.

9.1.14 If the product is to be used in the external wall of rooms expected to have high humidity, care must be taken to provide adequate permanent ventilation to avoid possible problems from the formation of interstitial condensation.

Surface condensation

9.1.15 In England and Wales, walls will adequately limit the risk of surface condensation when the thermal transmittance (U-value) does not exceed $0.7 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ at any point, and the junctions with other elements are designed in accordance with the guidance referred to in section 9.1.12 of this Certificate.

9.1.16 For buildings in Scotland, wall constructions will be acceptable when the thermal transmittance (U-value) does not exceed $1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ at any point, and the junctions with other elements are designed in accordance with the guidance referred to in BS 5250 : 2021. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 9.1.10 of this Certificate.

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 Installation must be carried out in accordance with this Certificate and the Certificate holder's instructions. A summary of instructions and guidance are provided in Annex A of this Certificate.

9.2.3 The inner leaf must be constructed ahead of the outer leaf, as the boards are fastened to the cavity face of the inner leaf. It is essential that the spacing of wall ties/clips allows one long edge of each board to be secured at a minimum of two points.

9.2.4 Vertical joints in the boards must be staggered and all joints tightly butted. Where protrusions occur in the cavity, the boards should be carefully cut to fit.

9.2.5 If installation of the boards is terminated below the highest level of the wall, the top edge of the insulation must be protected by a cavity tray and alternate perpend joints raked out to provide adequate drainage of water from the tray.

9.2.6 In all situations, it is particularly important to ensure during installation that:

- installation is carried out to the highest level on each wall or the top edge of the insulation is protected by a cavity tray
- cavity trays are used with appropriate stop ends and weepholes at lintel level
- cavity battens and/or boards are used during construction to prevent bridging by mortar droppings
- wall ties are installed correctly and are thoroughly clean
- excess mortar is cleaned from the cavity face of the leading leaf and any debris removed from the cavity
- mortar droppings are cleaned from the exposed edges of installed boards
- insulation boards are properly installed and interlocked using the rebated edges
- the DPC at ground level does not project into the cavity, as it can form a trap for mortar bridging
- raked or recessed mortar joints are avoided in very severe exposure areas.

9.2.7 Wall corners must be constructed in accordance with Annex A section *Additional Information on Installation* and must incorporate a vertical DPC as shown in Figures 6 and 7.

9.3 Workmanship

Practicability of installation was assessed by the BBA, on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the product must be carried out by a competent general builder, or a contractor, experienced with this type of product.

9.4 Maintenance and repair

As the product is confined within the wall cavity and has suitable durability, maintenance is not required.

10 Manufacture

10.1 The production processes for the product have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

† 10.2 The BBA has undertaken to review the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

11 Delivery and site handling

11.1 The Certificate holder stated that the product is delivered to site in packaging bearing the product name, Certificate holder's name, batch number, and the BBA logo incorporating the number of this Certificate.

11.2 Delivery and site handling must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.2.1 The product must be protected from prolonged exposure to sunlight and must be stored either under cover or protected with opaque polythene sheeting. Where possible, packs should be stored inside. If outside, the product must be stacked flat, and raised above ground level and not in contact with ground moisture.

11.2.2 Care must be taken when handling the boards to avoid crushing the edges or corners.

11.2.3 The product must not be exposed to open flame or other ignition sources, or solvents or other chemicals.

11.2.4 If damaged or wet, the product must be discarded.

ANNEX A – SUPPLEMENTARY INFORMATION †

Supporting information in this Annex is relevant to the product but has not formed part of the material assessed for the 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.

CE marking

The Certificate holder has taken the responsibility of CE marking the product, in accordance with harmonised European Standard EN 13165 : 2012.

Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by Certification Europe (Certificate 2005/262 A/8).

Additional information on installation

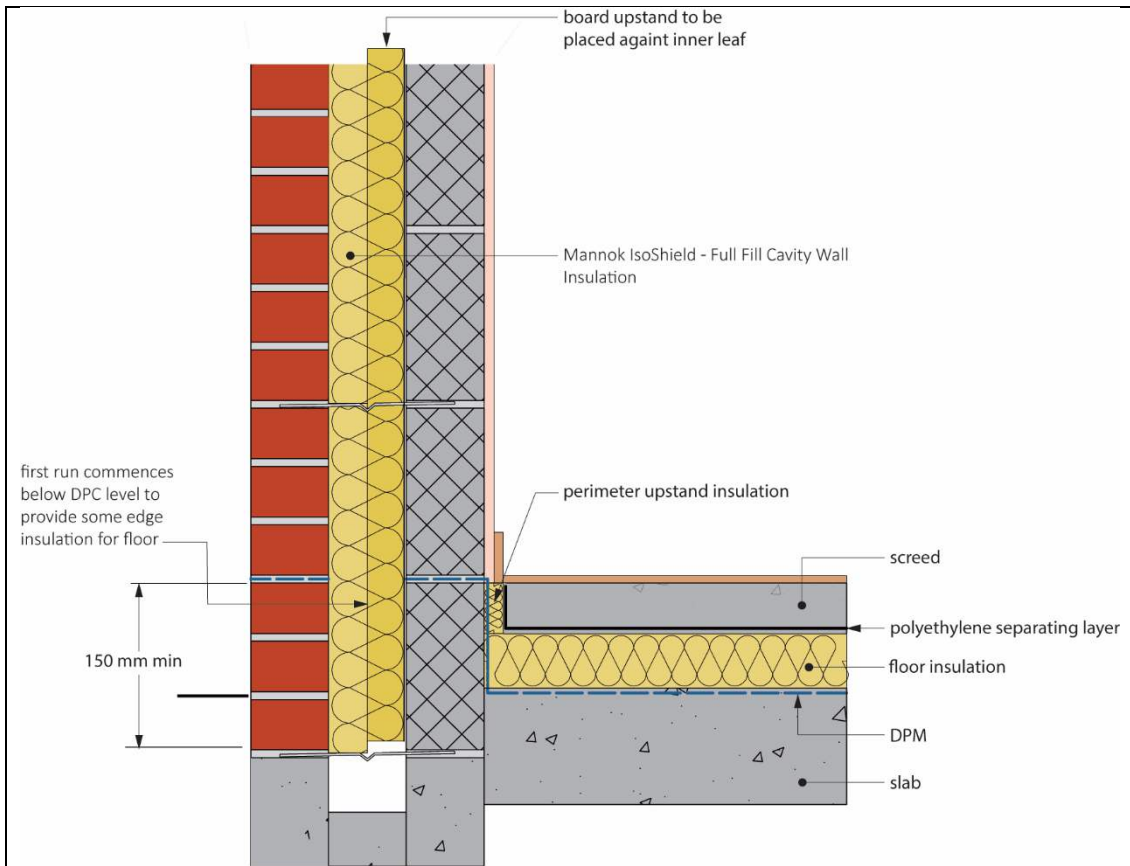
A.1 The Certificate holder will provide on-site demonstrations on request, to ensure correct installation from the outset.

A.2 Adequate supervision of the installation must be maintained, and the Certificate holder must have right of access to site to ensure correct installation.

Procedure

A.3 A section of the inner leaf is built, with the first row of wall ties, at approximately 600 mm horizontal spacing, where the insulation is to begin. The wall ties should not be placed directly on the DPC. The first run of boards should commence at least 150 mm below the DPC level, to provide some edge insulation for the floor (see Figure 2).

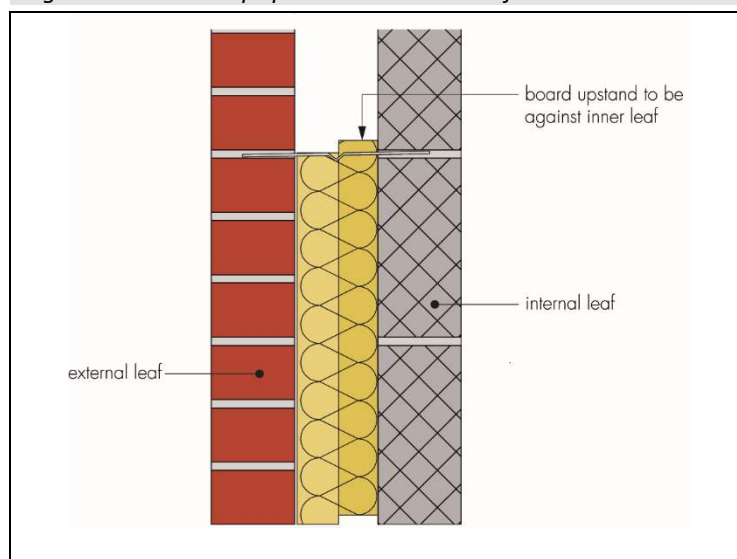
Figure 2 First row of boards at DPC level



A.4 The inner leaf is then built up to a course above the next row of wall ties, which are placed at a vertical spacing of 450 mm, depending on the height of insulation being used and not more than 900 mm horizontally (see BS EN 1996-1-2 : 2005). Excess mortar should be cleaned from the cavity face of the inner leaf.

A.5 The boards are placed between the upper and lower wall ties to form a closely butt-jointed run. It is essential that all wall ties slope downwards towards the outer leaf, with the drip positioned in the centre of the boards, pointing downwards to shed water away from the inner leaf (see Figure 3).

Figure 3 Wall tie drips positioned in centre of boards



A.6 The boards incorporate a specially designed rebated edging so that each subsequent row of boards interlocks tightly with the previous row by slotting the rebated edges together in a jigsaw effect. The 15 mm rise of the rebated edge on the top edge of the board points upwards and is installed against the internal leaf (see Figure 3).

A.7 The corresponding edges of the two interlocking boards are cut with a sharp knife or fine-tooth saw to allow insertion of the wall ties, so that they are sloping downwards to the outer leaf. Care must be taken to ensure that damage is minimised during this process.

A.8 The external leaf is built up to the same level as the boards. The thickness of the boards is 3 mm less than the width of the cavity in order to accommodate mortar squeeze.

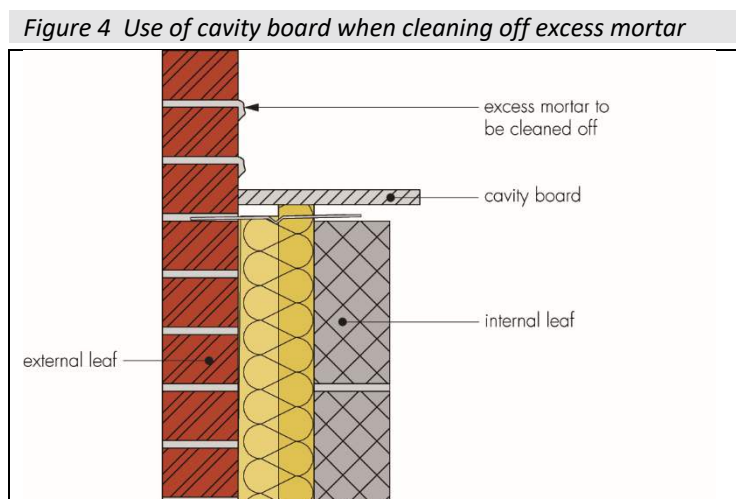
A.9 Successive sections of wall, incorporating wall ties, are constructed and the boards installed as work proceeds up to the required height.

A.10 Additional ties may be required to satisfy the structural requirements of BS EN 845-1 : 2013, BS EN 1996-1-1 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006, to ensure adequate retention of boards or cut pieces.

A.11 All boards should be butted, with vertical joints staggered. Insulation boards and wall ties should be staggered as construction proceeds and carried up to the highest level of wall, except where protected by a cavity tray.

Mortar droppings

A.12 After each section of the leading leaf is built, excess mortar must be removed from the cavity face and mortar droppings cleaned from exposed edges of the installed board before installation of the next section. Use of a cavity board or a cavity batten will protect installed board edges and help to keep the cavity clean as the following leaf is built (see Figure 4).



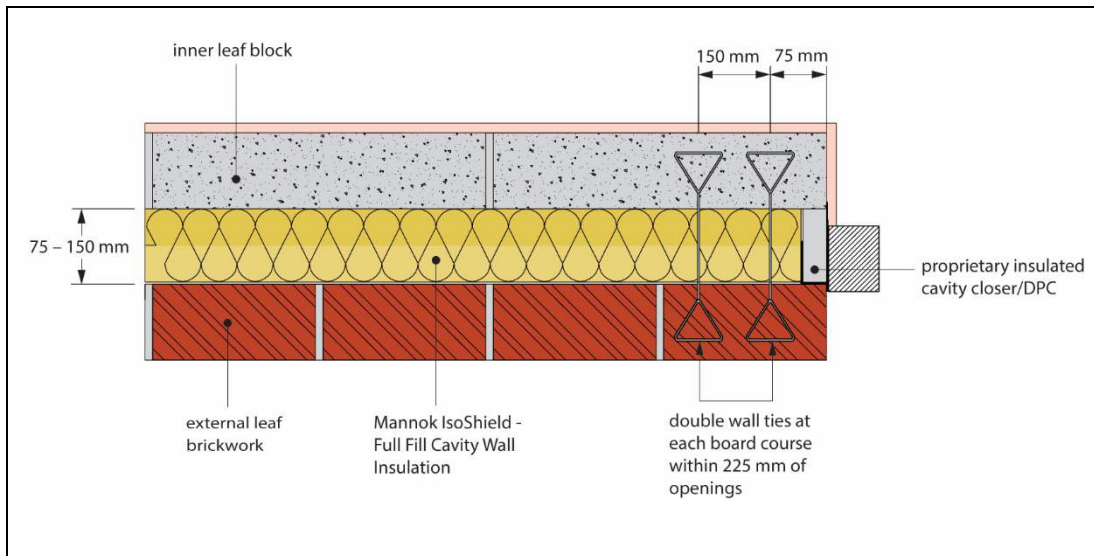
A.13 The boards can be cut using a sharp knife or fine-toothed saw, to fit openings, eg around windows, doors and airbricks. It is essential that cut pieces completely fill the spaces for which they are intended and are adequately secured.

Wall openings

A.14 Where openings such as doors and windows are in close proximity, it is recommended that a continuous lintel or cavity tray is used. Individual lintels or cavity trays should have stop ends and be adequately drained.

A.15 Where the boards are required to be fitted around openings, the rebated edge should be trimmed using a sharp blade. It is important that the rebated edge is cut accurately so that a tight butt edge is formed at the opening interfaces. It must be ensured that proprietary cavity barriers/closers are correctly installed at window and door reveals (see Figure 5). Care should be taken when fitting the extra wall ties around openings into the rebated edge.

Figure 5 Reveal details – cavity closer



A.16 Additional wall ties at 300 mm vertical centres within 225 mm of all openings are recommended in BS EN 1996-1-1 : 2005 and BS EN 1996-1-2 : 2005. This would involve piercing the boards and may introduce an unacceptable risk of water penetration. Therefore, it is recommended that an additional wall tie is included within 225 mm of the opening on each board course level to satisfy the structural requirements of the wall (see Figure 5).

Corners

A.17 At corner junctions the boards should be butt jointed by removing the rebated edge. It is important that the rebated edge is cut accurately, ensuring all edges are butted tightly with no air gaps achieving continuity of the thermal envelope around the corners. All corner details incorporate a vertical DPC with a 150 mm overlap beyond the board ends (at all courses), as shown in Figures 6 and 7.

Figure 6 External corner detail

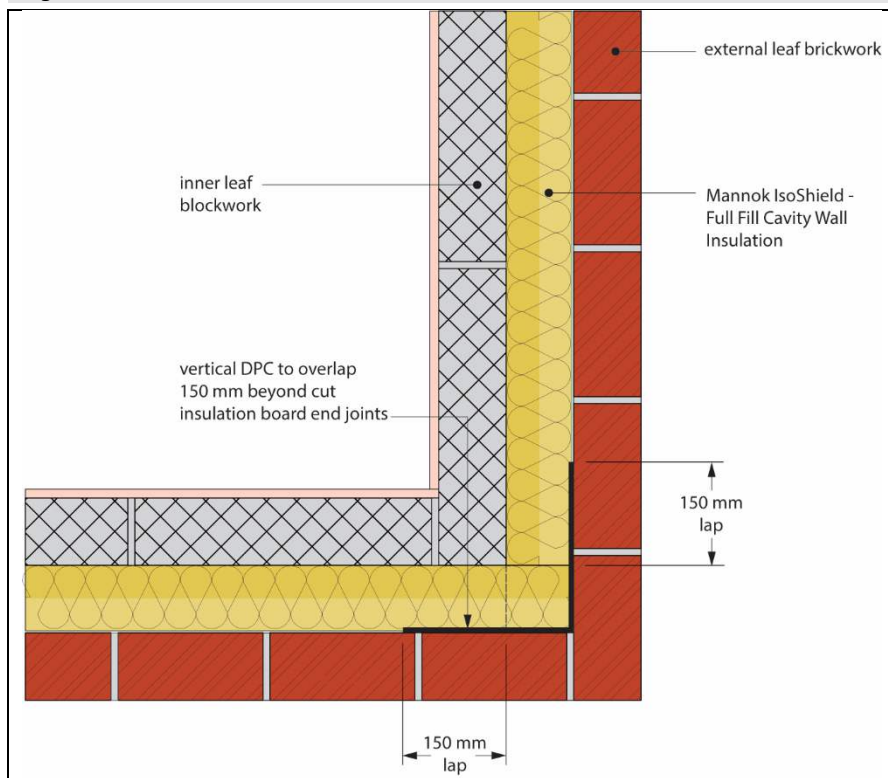
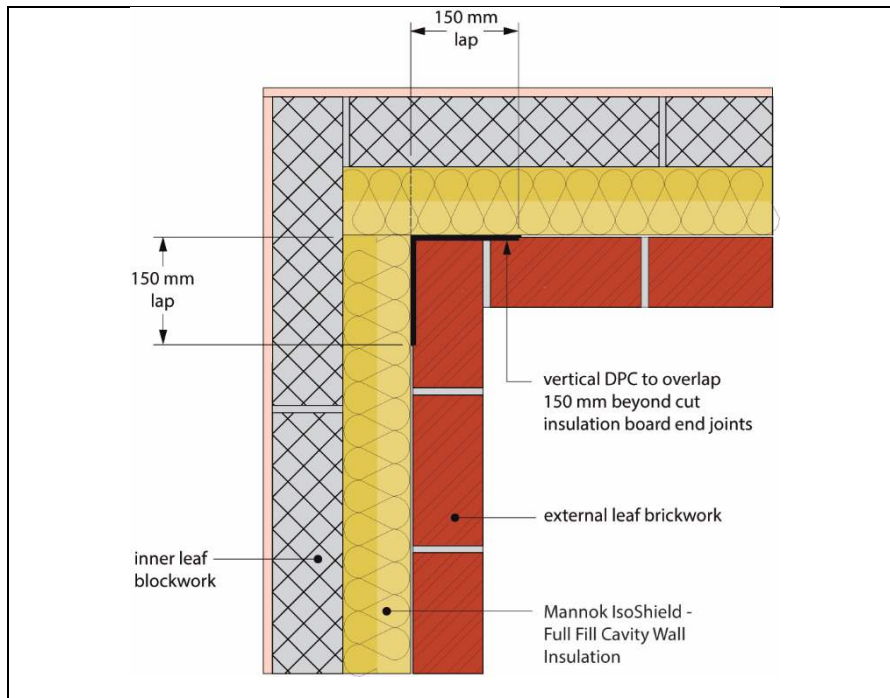


Figure 7 Internal corner detail



Protection

A.18 Exposed areas of boards must always be covered at the end of a day's work or during rainfall.

A.19 All building involving the product, particularly interrupted work, must conform to the relevant sections of BS EN 1996-2 : 2006.

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BS EN 1604 : 2013 *Thermal insulating products for building applications — Determination of dimensional stability under specific temperature and humidity conditions*

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BS EN 1996-1-1 : 2005 + A1 : 2012 Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures

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BS EN 1996-1-2 : 2005 Eurocode 6 — Design of masonry structures — General rules — Structural fire design

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