

Saint-Gobain Construction Products UK Limited
trading as Celotex

Lady Lane Industrial Estate
Hadleigh
Ipswich
Suffolk IP7 6BA

Tel: 01473 822093 Fax: 01473 820880

e-mail: technical@celotex.co.uk

website: www.celotex.co.uk



Agrément Certificate

16/5343

Product Sheet 2

CELOTEX INSULATION

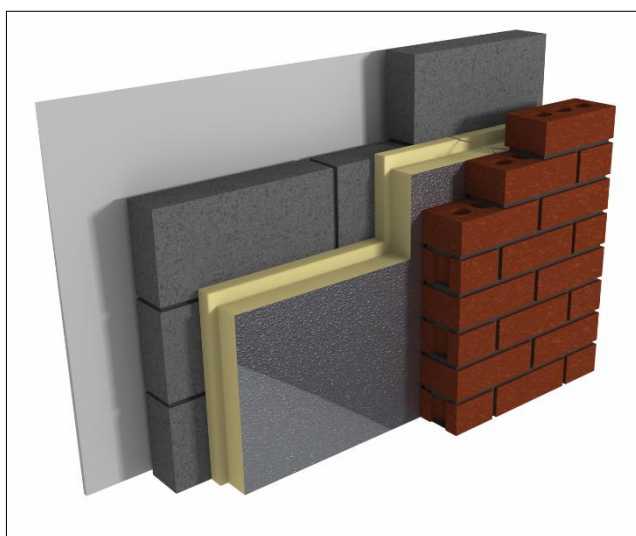
CELOTEX CF5000 PIR INSULATION FOR FULL FILL CAVITY WALLS

This Agrément Certificate Product Sheet⁽¹⁾ relates to Celotex CF5000 PIR Insulation for Full Fill Cavity Walls, comprising foil-faced rigid polyisocyanurate (PIR) foam boards for use as full fill thermal insulation in external masonry cavity walls up to 25 m in height in new buildings of a domestic and non-domestic nature (additional requirements apply for buildings above 12 m in height). The product is installed during construction.

(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

Thermal properties — the product has a declared thermal conductivity (λ_D) of $0.021 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ (see section 6).

Water resistance — the product will resist the transfer of water across the cavity (see section 7).

Condensation risk — the product can contribute to limiting the risk of condensation (see section 8).

Behaviour in relation to fire — use of the product does not prejudice the fire resistance properties of the wall (see section 9).

Durability — the product is durable, rot proof, water resistant and sufficiently stable to remain effective as insulation for the life of the building (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

Date of First issue: 12 August 2016

John Albon – Head of Approvals
Construction Products

Claire Curtis-Thomas
Chief Executive

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
Watford
Herts WD25 9BA

©2016

tel: 01923 665300
fax: 01923 665301
clientservices@bba.star.co.uk
www.bbacerts.co.uk

Regulations

In the opinion of the BBA, Celotex CF5000 PIR Insulation for Full Fill Cavity Walls, 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 (structure)
Comment:		The product can contribute to satisfying this Requirement. See sections 9.1 and 9.3 of this Certificate.
Requirement:	C2(a)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See section 7.1 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See section 7.2 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See sections 8.1 and 8.4 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product can contribute to satisfying this Requirement. See section 6 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is an acceptable material. See section 12 and the <i>Installation</i> part of this Certificate.
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 consumption rates for new buildings (applicable to Wales only)
Regulation:	26B	Fabric performance values for new dwellings (applicable to Wales only)
Comment:		The product can contribute to satisfying these Regulations. See section 6.2 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The product can contribute to a construction satisfying this Regulation. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	2.6	Spread to neighbouring buildings
Comment:		The product is not non-combustible but may be used in walls of domestic and non-domestic buildings in accordance with the exceptions permitted in the Standard, with reference to clauses 2.6.5 ⁽¹⁾ and 2.6.6 ⁽²⁾ . See sections 9.2 and 9.3 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The product can contribute to a construction satisfying this Standard, with reference to clause 3.4.1 ⁽¹⁾⁽²⁾ . See section 7.1 of this Certificate.

Standard:	3.10	Precipitation
Comment:		The product can contribute to satisfying this Standard, with reference to clause 3.10.1 ⁽¹⁾⁽²⁾ provided it complies with the conditions set out in section 7.2 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 sections 8.1 and 8.5 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		This product can contribute to satisfying clauses, or parts, of 6.1.1 ⁽¹⁾ , 6.1.2 ⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.9 ⁽¹⁾ and 6.2.11 ⁽²⁾ of these Standards. 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 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⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See section 6.1 of this Certificate.
Regulation:	12	Building standards applicable to 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	Fitness of materials and workmanship
Comment:		The product is an acceptable material. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	28(a)	Resistance to moisture and weather
Comment:		The product can contribute to a construction satisfying this Regulation. See section 7.1 of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The product can contribute to satisfying this Regulation. See section 7.2 of this Certificate.
Regulation:	29	Condensation
Comment:		The product can contribute to satisfying this Regulation. See section 8.1 of this Certificate.
Regulation:	35(4)	Internal fire spread - structure
Comment:		The product can contribute to satisfying this Regulation. See sections 9.1 and 9.3 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide emission rate
Comment:		The product can contribute to satisfying these Regulations. See section 6 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 section: 3 *Delivery and site handling* (3.4) of this Certificate.

Additional Information

NHBC Standards 2016

NHBC accepts the use of Celotex CF5000 PIR Insulation for Full Fill Cavity Walls, other than in very severe exposure locations with fair-faced masonry, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards 2016*, Chapter 6.1 *External masonry walls*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13165 : 2012. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

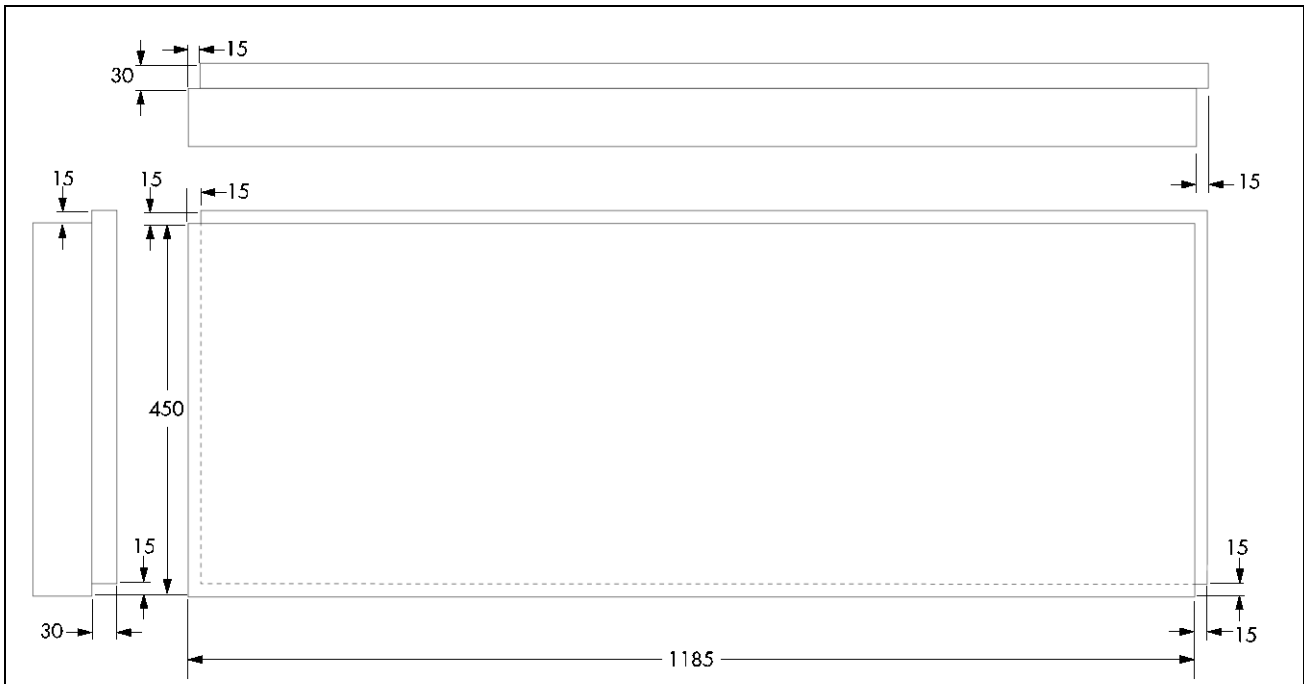
Celotex CF5000 PIR Insulation for Full Fill Cavity Walls comprises foil-faced rigid polyisocyanurate (PIR) foam board with aluminium foil-facings with the nominal characteristics given in Table 1 of this Certificate.

Table 1 Nominal characteristics

Product	Facings	Board size (mm)	Thickness range (mm)	Edge profile
Celotex CF5000	Aluminium foil-facing both sides (no printing)	1185 x 450	72, 97, 122 and 147	rebated on all 4 sides ⁽¹⁾

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

Figure 1 Celotex CF5000 PIR Insulation (all dimensions in mm)



2 Manufacture

2.1 Celotex PIR insulation is manufactured by a lamination process formed between foil-facings that are glued together in a continuous laminator, where the 'adhesive' is a mixture of two primary chemicals, polyol and MDI. An added blowing agent causes the adhesive to expand into foam that hardens, which is then cut to its finished board size and packed.

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 operated by the manufacturer are being maintained.

2.3 The management system of Celotex has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 and BS EN ISO 14001 : 2004 by SGS UK Ltd (Certificate GB91/504 and GB11/83526 respectively).

3 Delivery and site handling

3.1 The product is delivered to site in polythene-wrapped packs. Each pack of boards contains a label with the manufacturer's name, board dimensions and the BBA logo incorporating the number of this Certificate.

3.2 The product must be protected from prolonged exposure to sunlight, and stored dry, flat and raised above ground level (to avoid contact with ground moisture). Where possible, packs should be stored inside. If stored outside, they should be under cover, or protected with opaque polythene sheeting.

3.3 The product is light and easy to handle; care should be exercised to avoid crushing the edges or corners. If damaged, the product should be discarded.

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

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Celotex CF5000 PIR Insulation for Full Fill Cavity Walls.

Design Considerations

4 Use

4.1 Celotex CF5000 PIR Insulation for Full Fill Cavity Walls is satisfactory for use as a full fill cavity wall insulation and is effective in reducing the thermal transmittance (U value) of 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). The product is for use in new domestic and non-domestic buildings up to and including 25 m in height. It is essential that such walls are designed and constructed to incorporate the precautions given in this Certificate to prevent moisture penetration.

4.2 This Certificate covers the use of the product in any exposure zone. However, use of the product does not preclude the need to apply any external render coat or other suitable finish in severe exposure zones where such application would be normal practice.

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

4.4 Buildings subject to the national Building Regulations should be constructed in accordance with the relevant recommendations of:

- BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006 and their respective UK National Annexes
- BS EN 845-1 : 2013 and BS 8000-3 : 2001.

4.5 Other new buildings not subject to regulatory requirements should also be built in accordance with the Standards identified in section 4.4 of this Certificate.

4.6 Cavity wall ties, and if required, any additional ties to BS EN 845-1 : 2013, should 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.

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

- cavity trays and damp-proof courses (dpc's)
- cavity barriers and fire dampers
- resistance to the ingress of precipitation, moisture and dangerous gases from the ground
- resistance to sound transmission when flanking separating walls and floors.

Buildings over 12 metres high and up to and including 25 metres high

4.8 Where the walls of a building are between 12 and 25 m high, the following requirements also apply:

- from ground level, the maximum height of continuous cavity must not exceed 12 metres. Above 12 metres, the maximum height of continuous cavity 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 an infill panel in a framed structure
- the Certificate holder, in association with the architect, should carry out the 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.

5 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

6 Thermal performance



6.1 Calculations of the thermal transmittance (U value) of specific external wall constructions should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report BR 443 : 2006, using the declared thermal conductivity (λ_D)* of $0.021 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.

6.2 The value of a completed wall will depend on the insulation thickness, number and type of fixings, the insulating value of the substrate masonry and its internal finish. Calculated U values for example constructions are given in Table 2.

Table 2 Example U values⁽¹⁾ — new buildings

U value requirement ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$)	Insulation thickness ⁽¹⁾⁽²⁾ (mm)	
	13 mm dense plaster ⁽³⁾ 100 mm dense block ⁽⁴⁾	Plasterboard on dabs 100 mm AAC block ⁽⁵⁾
0.13	—	147
0.15	147	122
0.17	122	122
0.18	122	97
0.19	122	97
0.25	97	72
0.26	97	72
0.27	72	72
0.30	72	72
0.35	72	72

(1) Assumes fixings correction for fully-penetrating stainless steel fixings ($17 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) at 2.5 per m^2 with a cross-sectional area of 12.5 mm^2 , nominal U value and 102 mm thick brick outer leaf.

(2) 3 mm residual cavity assumed fully filled with mortar squeeze, $\lambda = 0.94 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.

(3) Plaster thermal conductivity of $0.57 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.

(4) Block and mortar thermal conductivity of $1.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ and $0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ respectively.

(5) Block and mortar thermal conductivity of $0.12 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ and $0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ respectively.

Junctions



6.3 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. Advice can also be sought from the Certificate holder.

7 Water resistance



7.1 The product may be used in situations where it bridges the damp-proof course (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.

7.2 Constructions incorporating the product and built in accordance with the Standards listed in section 4.4, will resist the transfer of precipitation to the inner leaf and satisfy the national Building Regulations.

7.3 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 weep holes 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
- dpc's at ground level do not project into the cavity as they can form a trap for mortar bridging
- insulation boards are properly installed and butt-jointed
- raked or recessed mortar joints are avoided in very severe exposure areas.

7.4 Window and door opening reveals should be constructed incorporating a cavity barrier/closer/dpc, as required (see sections 13 and 14).

7.5 Wall corners are to be constructed incorporating a vertical dpc as noted in section 14.15.

8 Condensation risk

Interstitial condensation



8.1 Walls will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011, Annexes D and G, and the relevant guidance.

8.2 The foil-facings have a water vapour resistance of $1000 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$, and the insulation core has a water vapour resistivity of $300 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$ and, therefore, will provide significant resistance to water vapour transmission.

8.3 If the product is to be used in the external walls 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



8.4 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 6.3 of this Certificate.



8.5 For buildings in Scotland, constructions will be acceptable where 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 : 2011, Annex G. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 6.3 of this Certificate.

9 Behaviour in relation to fire



9.1 The product is not classified as being of limited combustibility but the requirements of the national Building Regulations relating to fire spread in cavity walls can be met in buildings of all-purpose groups without the need for cavity barriers or height restriction, provided the construction complies with the provisions detailed in:

England and Wales — Approved Document B, Volume 1, Diagram 13 and Volume 2, Diagram 34
Northern Ireland — Technical Booklet E, Diagram 4.5.



9.2 The product is not classified as non-combustible but may be used without height restriction in a wall on, or less than 1 m from, a relevant boundary 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.



9.3 For constructions not covered by sections 9.1 and 9.2, the use of the product is restricted to 18 m in height and cavity barriers must be provided to comply with:

England and Wales — Approved Document B, Volume 1, section 6 and Volume 2, section 9

Scotland — Mandatory Standard 2.4, clauses 2.4.1⁽¹⁾⁽²⁾, 2.4.2⁽¹⁾⁽²⁾, 2.6.5⁽¹⁾ and 2.6.6⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet E, Paragraphs 4.36 to 4.39.

10 Proximity of flues and appliances

When installing the product in close proximity to certain flue pipes and/or heat-producing appliances, the relevant provisions of the national Building Regulations are applicable:

England and Wales — Approved Document J, sections 1 to 4

Scotland — Mandatory Standard 3.19, clauses 3.19.1⁽¹⁾⁽²⁾ to 3.19.9⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet L, sections 1 to 6.

11 Maintenance

As the product is confined within the wall cavity and has suitable durability (see section 12), maintenance is not required.

12 Durability



The product is unaffected by the normal conditions in a wall, and is durable, rot proof, water resistant and sufficiently stable to remain effective as insulation for the life of the building.

Installation

13 General

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

13.2 Adequate supervision of the installation should be maintained and the Certificate holder must have right of access to site to ensure correct installation.

13.3 It is recommended that the external leaf is constructed ahead of the internal leaf so that any mortar protruding into the cavity space from the back of the external leaf can be cleaned off before installing the product. Boards must not be pushed into a completed cavity.

13.4 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.

13.5 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 this tray.

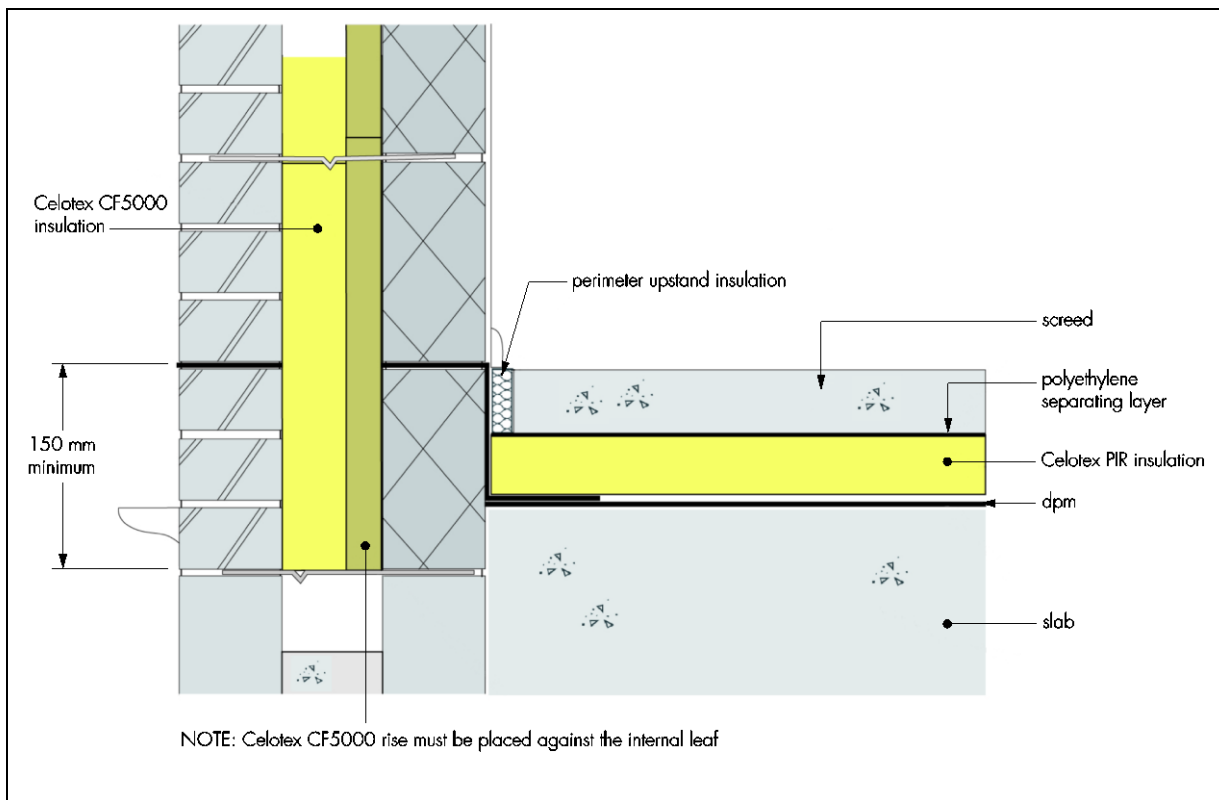
13.6 Where required, door and window reveals should incorporate a cavity barrier/closer (see Figure 6). It is recommended that BBA-approved cavity barriers/closers are used.

13.7 Wall corners must be constructed in accordance with section 14.15 and must incorporate a vertical dpc as shown in Figure 6.

14 Procedure

14.1 A section of the internal leaf is built in the conventional manner, with the first row of wall ties, at approximately 600 mm horizontal spacings, where the insulation is to begin. The wall ties should not be placed directly on the dpc. The first run of boards should commence below the dpc level to provide some edge insulation for the floor (see Figure 2). For further junction detailing, see section 6.3 of this Certificate.

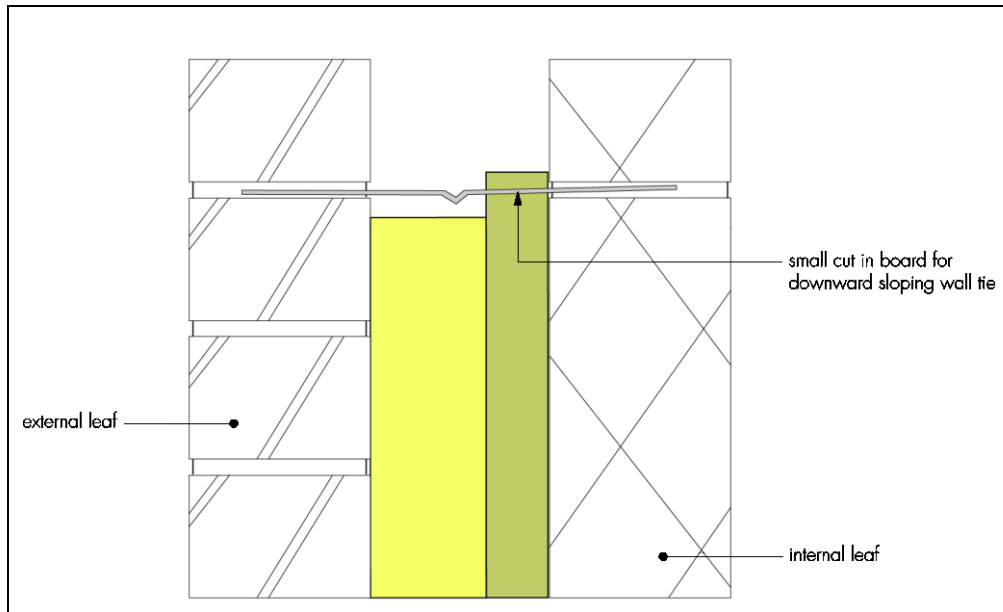
Figure 2 First row of boards at dpc level



14.2 The external 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 vertically, 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 internal leaf.

14.3 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



14.4 The boards incorporate 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).

14.5 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.

14.6 The internal 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.

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

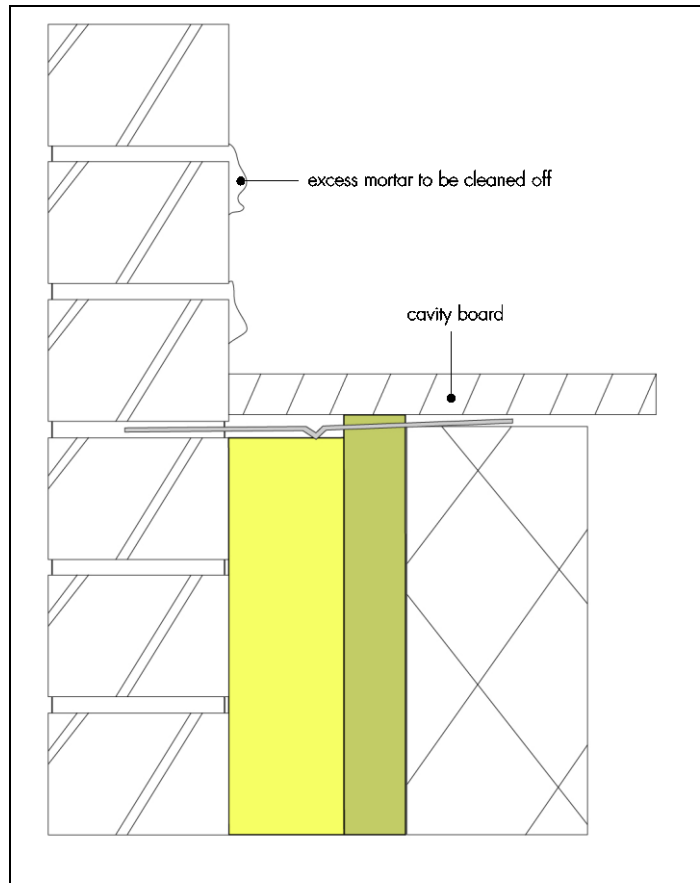
14.8 Additional ties may be required to satisfy the structural requirements of BS EN 845-1 : 2013, BS EN 1996-1-1 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006, to ensure adequate retention of boards or cut pieces.

14.9 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

14.10 After each section of the wall leaf is built, excess mortar should 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 is recommended to protect installed board edges and help to keep the cavity clean as the following leaf is built (see Figure 4).

Figure 4 Use of cavity board when cleaning off excess mortar

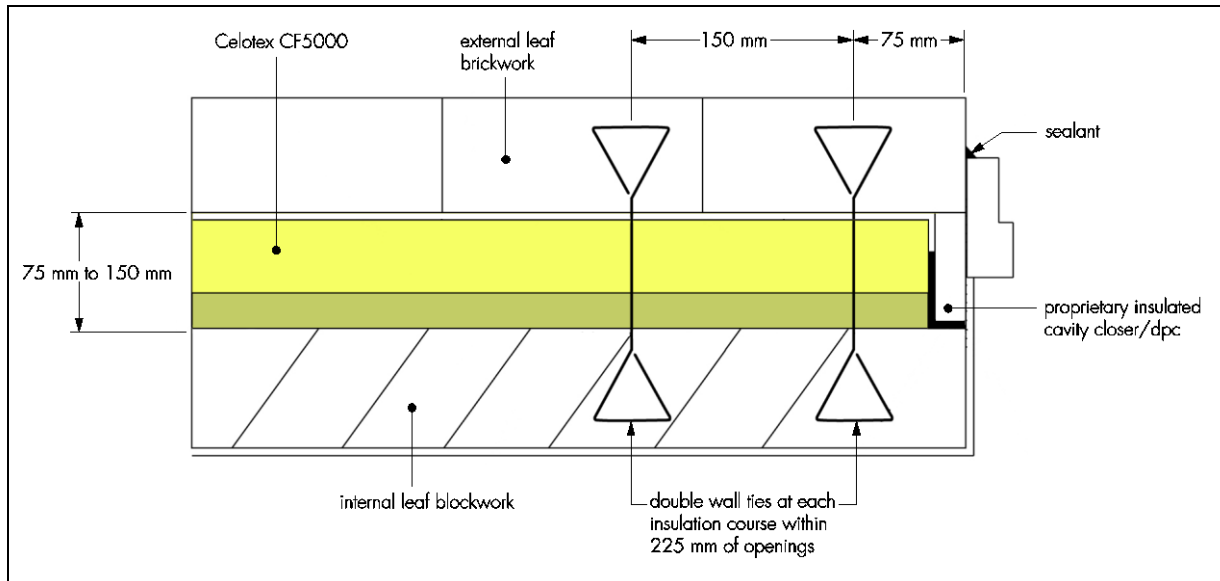


Wall openings

14.11 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 stopends and be adequately drained.

14.12 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

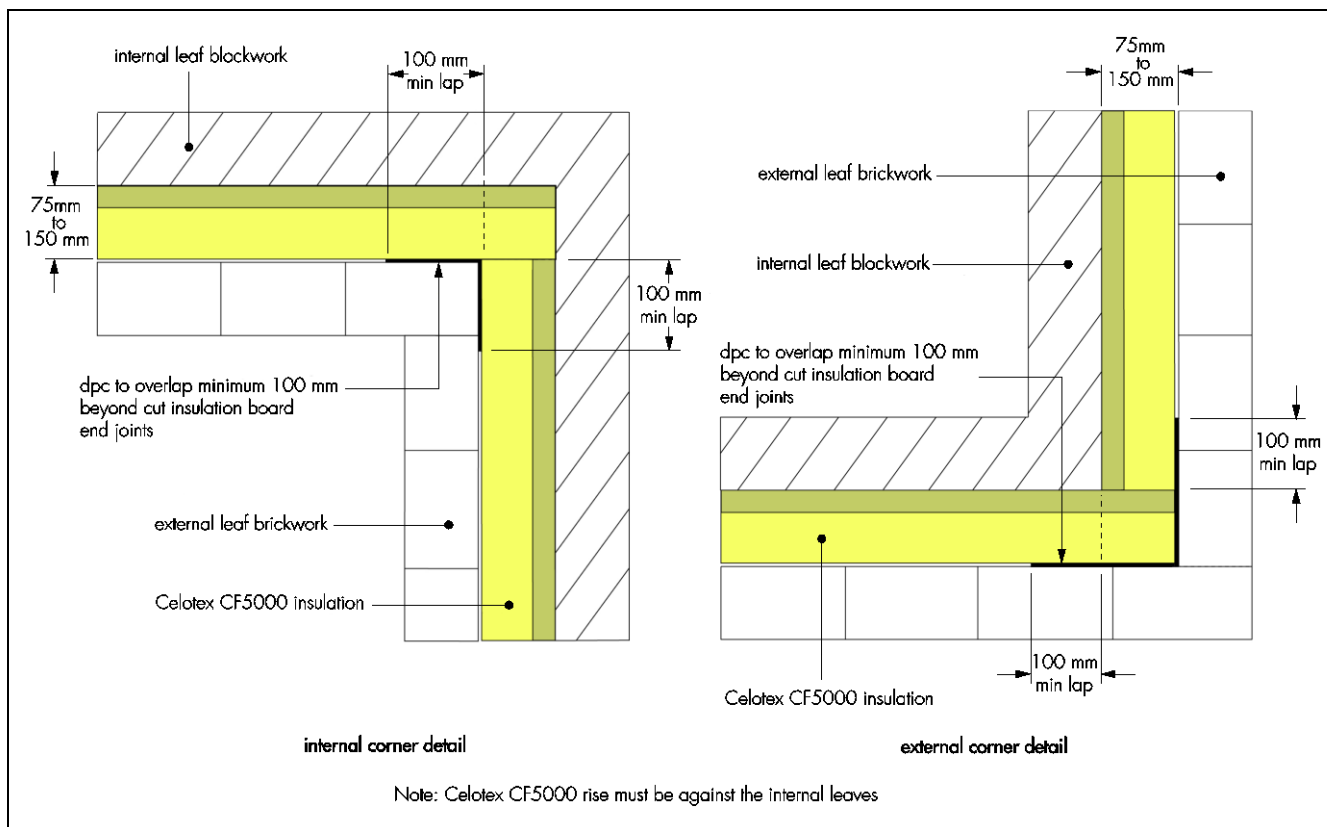


14.13 Additional wall ties at 300 mm vertical centres within 225 mm of all openings are recommended in BS EN 1996-1-1 : 2005 and BS EN 1996-1-2 : 2005. For this product, this would involve piercing the boards and may introduce an unacceptable risk of water penetration. Therefore, it is recommended that 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.

Corners

14.14 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, thus achieving continuity of the thermal envelope around the corners. All corner details incorporate a vertical dpc with a 100 mm overlap beyond the board ends (at all courses) as shown in Figure 6.

Figure 6 Corner details



Protection

14.15 Exposed areas of board should always be covered at the end of a day's work or in driving rain.

14.16 All building involving the product, particularly interrupted work, must conform to BS EN 1996-2 : 2006, Sections 3.2 *Acceptance, handling and storage of materials* and 3.6 *Curing and protective procedures during execution*.

Technical Investigations

15 Tests

Results of tests were assessed to determine:

- resistance to rain penetration of an insulated cavity wall
- thermal conductivity
- dimensional accuracy
- compressive strength
- dimensional stability under specific temperature and humidity conditions
- water absorption
- water vapour transmission.

16 Investigations

16.1 Existing data on toxicity, durability and properties in relation to fire were evaluated.

16.2 A condensation risk analysis was carried out.

16.3 A series of U value calculations was carried out.

16.4 A calculation was undertaken to confirm the thermal conductivity (λ_D).

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

Bibliography

BS 5250 : 2011 *Code of practice for control of condensation in buildings*

BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*

BS EN 845-1 : 2013 *Specification for ancillary components for masonry — Wall ties, tension straps, hangers and brackets*

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

NA to BS EN 1996-1-1 : 2005 *UK National Annex to Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

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

NA to BS EN 1996-1-2 : 2005 *UK National Annex to Eurocode 6 — Design of masonry structures — General rules — Structural fire design*

BS EN 1996-2 : 2006 *Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*

NA to BS EN 1996-2 : 2006 *UK National Annex to Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*

BS EN 1996-3 : 2006 *Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*

NA to BS EN 1996-3 : 2006 *UK National Annex to Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*

BS EN 13165 : 2012 *Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification*

BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

BS EN ISO 14001 : 2004 *Environmental management systems — Requirements with guidance for use*

BRE Report (BR 262 : 2002) *Thermal insulation : avoiding risks*

BRE Report (BR 443 : 2006) *Conventions for U-value calculations*

17 Conditions

17.1 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 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.

17.2 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.

17.3 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.

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

17.5 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.

17.6 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.