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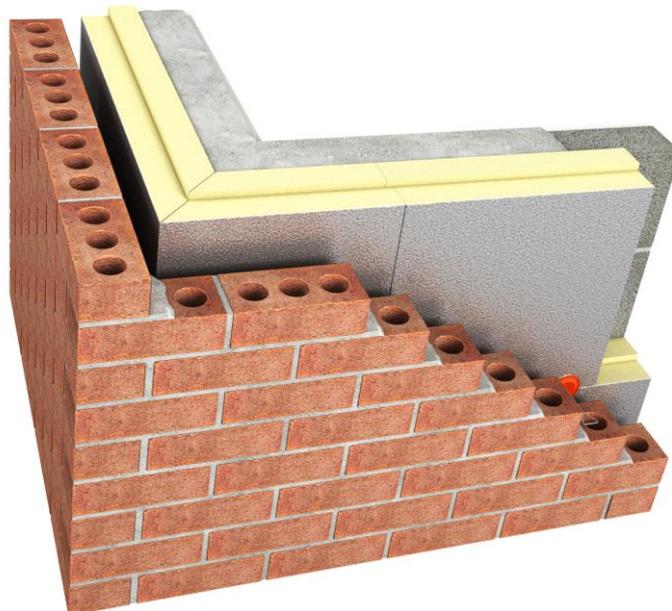
**IRISH AGRÉMENT BOARD
CERTIFICATE NO. 20/0422**

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Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity Wall Insulation System

NSAI Agrément (Irish Agrément Board) is designated by Government to carry out European Technical Assessments.

NSAI Agrément Certificates establish proof that the certified products are '**proper materials**' suitable for their intended use under Irish site conditions, and in accordance with the **Building Regulations 1997 to 2019**.



PRODUCT DESCRIPTION:

This Certificate relates to the Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system, comprising of rigid polyisocyanurate (PIR) foam boards with low emissivity foils face on each side. The insulation boards have rebated edges allowing them to be tightly interlocked when installed to reduce the thermal transmittance of cavity walls in new domestic or non-domestic buildings with masonry inner and outer leaves. The product is installed during the construction of the wall.

In the opinion of NSAI, the Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity Wall Insulation System as described in this Certificate, complies with the requirements of the Building Regulations 1997 to 2019.

USE:

The product is used for the thermal insulation of new cavity masonry walls of dwellings or buildings of similar occupancy type and conditions. It also facilitates the control of surface condensation in walls.

MANUFACTURE AND MARKETING:

The product is manufactured and marketed by:
Xtratherm Ltd.,
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Co. Meath,
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Readers are advised to check that this Certificate has not been withdrawn or superseded by a later issue by contacting NSAI Agrément, NSAI, Santry, Dublin 9 or online at www.nsai.ie

1.1 ASSESSMENT

In the opinion of NSAI Agrément, the Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system, if used in accordance with this certificate meets the requirements of the Irish Building Regulations 1997 to 2019 as indicated in Section 1.2 of this Agrément Certificate.

1.2 BUILDING REGULATIONS 1997 to 2019**REQUIREMENT:*****Part D – Materials and Workmanship***

D1 - The Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system, used in accordance with this NSAI Agrément Certificate meets the requirements for workmanship.

D3 - The Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system, as certified in this Certificate, are comprised of proper materials fit for their intended use.

Part B – Fire Safety***Part B Vol 2 – Fire Safety*****B3/B8 – Internal fire spread (Structure)**

When installed and used in accordance with this certificate, the Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system can meet this requirement.

Part C – Site Preparation and Resistance to Moisture**C4 – Resistance to Weather and Ground Moisture**

The Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system when installed in accordance with this Certificate will not promote the passage of moisture and will minimise the risk of surface or interstitial condensation.

Part F – Ventilation**F1 – Means of ventilation**

The Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system as certified, can be incorporated into structures that meet the requirements of this Regulation.

Part J – Heat Producing Appliances**J3 – Protection of Building**

In the opinion of NSAI Agrément, if used in accordance with this Certificate the Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system, can meet this requirement.

Part L – Conservation of Fuel and Energy**L1 – Conservation of Fuel and Energy**

The Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system can contribute to complying with the requirements of this regulation. The manufacturers declared Thermal conductivity ($\lambda_{90/90}$) of the polyisocyanurate (PIR) composite board is 0.020 W/(mK)*.

Walls using the Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system can meet or contribute to meeting the current U-value requirements in partial fill cavity wall insulation applications depending on the cavity width (see Table 3 and Cl. 4.4 & 4.5 of this Certificate).

2.1 PRODUCT DESCRIPTION

The Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system comprises of a polyisocyanurate (PIR) board, manufactured in accordance with the requirements of I.S. EN 13165^[7]. Standard board dimensions are given in Table 1.

Table 1: Nominal Dimensions	
Size (mm)	1200 x 450
Thickness ⁽¹⁾ (mm)	70mm - 150mm (in 5mm increments)
Joint detail	Rebated
⁽¹⁾ Other thicknesses of boards are available at the request of the manufacturer.	

Table 1

2.2 MANUFACTURE

Raw materials, mixed to a controlled formulation, are blended and poured onto the foil-facing on a conveyor belt. The exothermic reaction expands the foam which then comes into contact with the upper foil-facer. An automatic process cures the product and cuts it to the required size. Polyisocyanurate is one type of Polyurethane (PU) foam which is a rigid cellular thermoset polymeric insulation with a substantially closed cell structure. The edges of the foil faced PIR boards are given an interlocking profiled rebate enabling the boards to be interlocked when installed.

The manufacturers declared Thermal conductivity ($\lambda_{90/90}$) of the polyisocyanurate (PIR) composite board is 0.020 W/(mK)*.

The management system of Xtratherm Ltd has been assessed and registered as meeting the requirements of I.S. EN ISO 9001^[8] and I.S. EN ISO 14001^[11].

2.3 CAVITY WALL TIES

Cavity wall ties wall ties approved by the Certificate holder and conforming to the requirements of I.S. EN 845-1^[9] should be used for structural stability in accordance with the relevant parts of I.S. EN 1996-1-1: (Eurocode 6)^[2], I.S. EN 1996-2^[10], I.S. EN 1996-3^[11] and Irish standard recommendation SR 325^[12].

Extra wall ties are required at the jamb of openings and movement joints as described in Diagram 9 of TGD Part A to the Irish Building regulations. Wall ties shall not be placed directly on the DPC.

2.4 ANCILLARY ITEMS

Xtrowall Corner Panels - The XtroWall Plus Cavity Wall System includes optional pre-formed corner panels that fold to 90 degrees to effectively insulate a junction that is normally vulnerable to thermal bridging and cold spots.

2.5 DELIVERY, STORAGE AND MARKING

Boards are delivered to site in packs wrapped in polythene. Each pack contains a label bearing the manufacturer's trade name and the NSAI identification mark incorporating the number of this Certificate and CE mark in accordance with the requirements of I.S. EN 13165^[7]. The DoP for this product is available by request from the manufacturer.

The product should be protected from prolonged exposure to sunlight and stored either under cover or protected with opaque polythene sheeting. The boards should also be protected from moisture. Care should be taken to avoid contact with solvents and with materials containing volatile organic components.

Boards must be stored flat, protected from high winds and raised above damp surfaces. Damaged and wet boards should be discarded. Boards must not be exposed to open flame or other ignition sources.

2.6 INSTALLATION PROCEDURE

2.6.1 General

On request, the Certificate holder's specialists will attend the site to provide demonstrations to ensure correct installation.

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

Typically, the internal leaf is constructed ahead of the external leaf. Care should be taken to ensure that any mortar droppings do not bridge the space in the cavity between the outer leaf and the insulation board. The use of a cavity board is recommended to protect the insulation board edges and to make cleaning easier. Any mortar protruding into the cavity space from the back of the internal leaf shall be cleaned off before installing the product. Boards should be protected from inclement weather during breaks in the installation process.

Workmanship and guidance for use should be in accordance with BS 8000-0^[14] and SR54^[13]. Raked or recessed mortar joints in brickwork must be avoided in very severe exposure areas.

2.6.2 Procedure

The first course of Xtratherm Xtrowall XO/XWP partial fill boards shall be installed at least 225 mm below the level of the top of the floor insulation to meet the requirements of the DHPLG publication Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details (ACD).

Careful detailing of the damp proof membrane (DPM) and damp-proof course (DPC) is required to provide the necessary resistance to weather and ground moisture in accordance with the requirements and provisions of TGD Part C: *Site preparation and resistance to moisture*. See Figure 1.

In addition, careful consideration should be given to drainage conditions in the area of the wall construction to ensure the cavities of the walls are clear of the water table with additional drainage installed as required.

Where required, Radon barriers or stepped DPCs should be dressed over the cavity either dissecting the board or dressed behind the riser boards and across the cavity below the insulation. The insulation should be butted tightly either side of the barrier to provide thermal continuity. Pre-formed detailing of Radon Barriers provides a more accurate solution. It is recommended that drainage holes be provided at approximately 1m centres in the perpendicular block joints above radon membrane level.

It is recommended that the inner leaf 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.

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

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 perpendicular joints raked out to provide adequate drainage of water from the tray.

Where required, door and window reveals should incorporate a suitable cavity barrier /closure.

A section of the internal leaf is built in the conventional manner, with the first row of wall ties at approximately 600mm 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 150mm below the dpc level to provide some edge insulation for the floor.

The internal leaf is then built up to a course above the next row of wall ties which are placed at spacings of 450 mm vertically and not more than 900 mm horizontally (per I.S. EN 1996-1-2^[15]). Excess mortar should be cleaned from the cavity face of the internal leaf.

Boards are placed between the upper and lower wall ties, behind the retaining clips with rebated boards tightly interlocked to form a closely jointed run. It is essential that all wall ties slope downward towards the external leaf with the drip positioned halfway across the residual cavity width, pointing downwards to shed water away from the internal leaf. Wall ties must not be placed at centres exceeding 900mm to ensure that each board is secured at a minimum of three points. The first row of boards must not be in contact with the ground.

The rebated boards must interlock tightly with the previous row by slotting the rebated edges together in a jigsaw effect. 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 downward to the outer leaf. Care should be taken to ensure that damage is minimised during this process. The external leaf is then built up to the level of the top of the boards.

Successive sections of wall, incorporating wall ties, are constructed and the boards installed as work proceeds up to the required height, maintaining an absolute minimum residual cavity of 40mm. Additional ties may be required to satisfy the structural requirements of I.S EN 845-1^[9], I.S EN 1996-1-1^[2], I.S EN 1996-2^[10] and I.S EN 1996-3^[11], to ensure adequate retention of the produce or cut pieces.

During construction, insulation boards and wall ties should be staggered to the highest level of the wall, except where protected by a cavity tray.

After each section of the leading leaf is built, excess mortar should be removed from the cavity face and mortar dropping cleaned from the exposed face of the installed board before installation of the next run of boards.

Where the cavity is bridged, e.g. by lintels, structural beams, flues, floor slabs or pipes, there is a potential that water will be conducted across it to cause dampness inside the building.

To avoid this problem, it is essential that watertight cavity trays are provided above all bridges of the cavity (other than wall ties), so that water is diverted to the outer leaf or clear of the bridge and that alternate perpendicular joints are raked out to provide adequate drainage of water from the tray.

Where openings such as windows and doors are in close proximity, it is recommended that a continuous lintel or cavity tray is used. Individual lintels and cavity trays should have stop-ends and be adequately drained. Insulation boards should be cut to butt tightly against the cavity barrier/closure/dpc.

Boards can be cut using a sharp knife or fine-toothed saw to fit around openings (e.g. around windows, doors). It is essential that cut pieces completely fill the spaces for which they are intended and are adequately secured.

Exposed areas of board should always be covered at the end of the day's work or in wet conditions to protect the installation from damage. All buildings where the Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system is used, particularly when the build is interrupted must conform to I.S EN 1996-2^[10], Section 3.2, Acceptance, handling and storage of materials and Section 3.6, Curing and protective procedures during execution.

Where a flue pipe from a heating system passes horizontally through a wall, the flue pipe shall be separated from the cavity insulation by non-combustible material in accordance with the Certificate holder's installation instructions to meet the requirements of TGD to Part J of the Building Regulations.

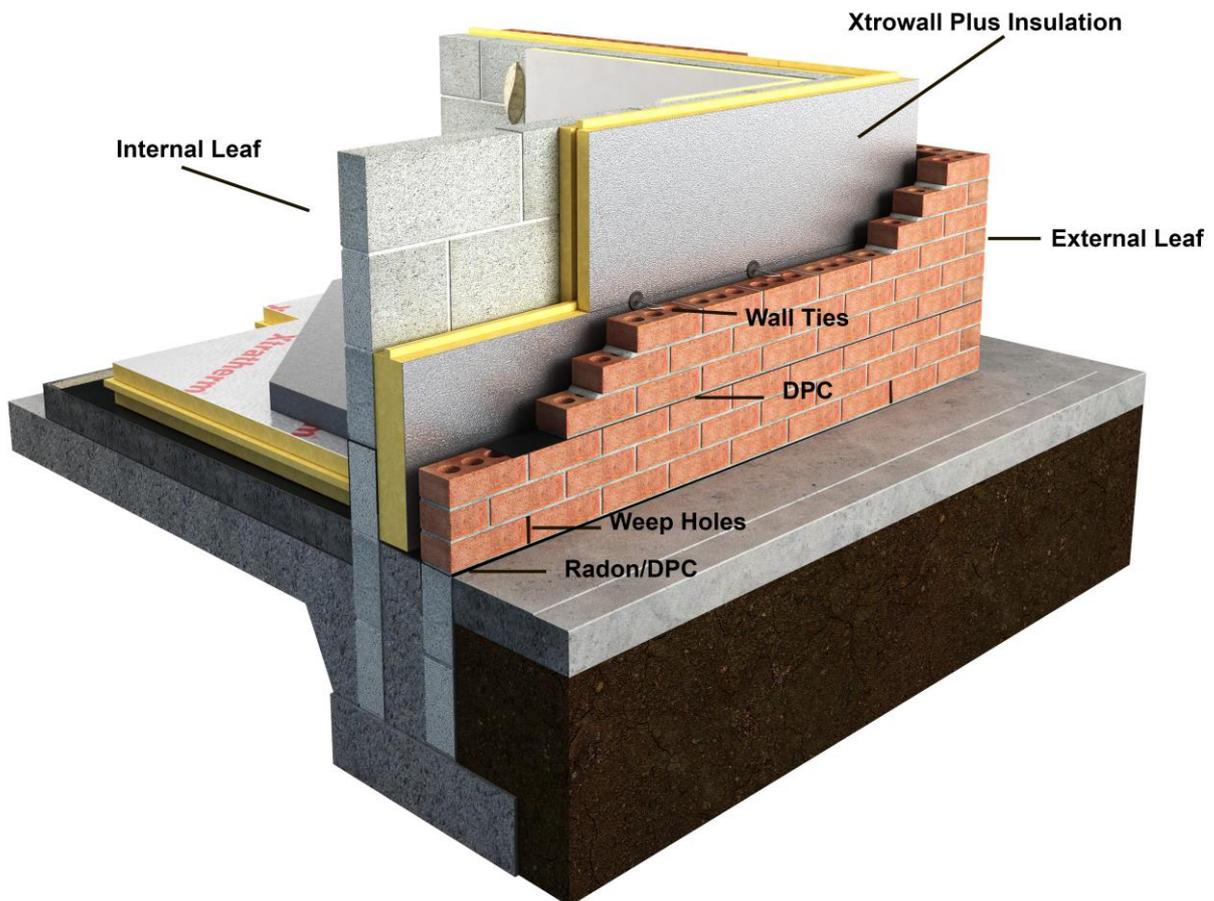


Figure 1 – Typical Installation Detail at Ground Level.

3.1 GENERAL

The Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system when installed in accordance with this Certificate, is effective in reducing the U-value (thermal transmittance) of new external masonry cavity walls, or calcium silicate bricks, concrete blocks, or natural and reconstituted stone blocks. It is essential that such walls are designed and constructed to prevent moisture penetration.

New masonry buildings should be constructed to comply with the requirements of TGD Part A to the Irish Building Regulations.

As with all cavity wall insulation, the construction detailing must comply with good building practice and meet DHPLG Acceptable Construction Details requirements where applicable.

It is recommended that installation be carried out to the highest level on each wall. On-site trimming of boards may be necessary to achieve this. As detailed in Cl. 2.4.2 of this certificate, where appropriate, the top edge, and any other vertical break in the insulation, should be protected by a cavity tray.

Partial filling of a cavity wall (i.e. filling part of the width of a cavity with insulant placed against the inner leaf) does not affect the resistance to wind-driven rain of the wall, providing the width of the remaining air space is not less than 40 mm and the wall tie drips are not less than 25 mm from the insulation. Widths less than this should not be used because of the risk of rain penetration.

The product can be used in situations where it bridges the damp-proof course (DPC) in walls but must be kept clear of contact with the ground by supporting the lowest row of installed insulation boards on wall ties providing a minimum clearance of 100mm between the bottom of the boards and the cavity ground level. Drainage to be provided in the areas of the wall as required to ensure the cavity of free form moisture. Perpend block joints to incorporate drainage holes where required.

The type and spacing of wall ties must conform to structural design requirements and will be dependent on, cavity width, wall length and height, and opening sizes. The effect of the wall ties should be included in the calculations for the thermal performance of the final construction.

The construction of walls with cavities in excess of 110mm wide requires adjustments to lintels, wall ties, cavity barriers, etc. It is therefore necessary that cavity walls are adequately designed in respect of structural stability and fire safety in accordance with Technical Guidance Documents (TGD), Parts A and B of the Building Regulations.

On request, and where installation guidance is sought, the Certificate holder's specialists will attend the site to provide demonstrations to ensure correct installation of the insulation system.

3.2 FIRE SAFETY

Cavity Barriers shall be installed as necessary to meet the requirements of TGD Part B, Volume 1, Cl. 3.3 and TGD Part B, Volume 2, Cl. 3.6.

Cavity walls should always have a fire stop closure at the top of the cavity and around openings. The materials must not be taken past fire stops. If fire does penetrate into an unventilated cavity the amount of air will be insufficient to support combustion and flame spread will be minimal.

The Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system is suitable for use on buildings of any purpose group without the need for cavity barriers, provided the construction complies with Diagram 17 of the TGD to Part B of the Irish Building Regulations and provided there is no combustible material exposed or situated within the cavity other than:

- timber lintels, window or door frames or the end faces of joists,
- pipes, ducts or cables,
- closers, flashings, dpc's or wall ties,
- thermal insulating material, or
- meter boxes which require an opening in the outer leaf of not greater than 800mm x 500mm and do not penetrate the inner leaf except through a sleeve of not more than 80mm x 80mm which is fire stopped where it passes through the inner leaf.

For construction that do not comply with the requirements item (ii) above, cavity barriers must be provided to comply with TGD Part B, Section 3.3 of the Irish Building Regulations.

Combustible material should be separated from a masonry chimney or a flueblock chimney by at least the following distance: (a) 200 mm from a flue, or (b) 40 mm from the outer surface of a chimney. Reference should be made to TDG Part J Clause 2.5.6 and diagram 5-14. For chimneys covered by IS EN 1856-1^[17], separation between this product and the external surface of the chimney shall be determined in accordance with Clause 2.5 of TGD to Part J of the Building Regulations 1997 to 2019 .

3.3 WATER PENETRATION

The product can be used in situations where it bridges the damp-proof course (DPC) in walls. Careful detailing is required at ground level as described in 2.4.2 of this certificate. Dampness from the ground will not pass through to the inner leaf provided the wall is detailed in accordance with the requirements and provisions on TGD Part C.

When the product is properly installed in accordance with this Certificate, it will resist water transfer across the cavity to the inner leaf. In all situations it is particularly important to ensure during installation that:

- 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 cleared from the exposed edges of the insulation boards.
- Insulation boards are properly installed and interlocked using the rebated edges. Installation is carried out to the highest level on each wall or the top edge of the insulation is protected by a cavity tray.
- At lintel level, a cavity tray, stop ends and weep holes are provided.
- Cavity barriers and/or boards are used during construction to prevent bridging by mortar droppings.
- Dpc's at ground level do not project into the cavity as they can form a trap for mortar bridging.
- Raked or recessed mortar joints are avoided in very severe exposure areas.

3.4 ELECTRICAL & PLUMBING SERVICES

The positioning and future access to all plumbing and electrical cabling services should be carefully considered during the design phase of the construction. On request, the Certificate holder can provide advice regarding correct installation with regard to electrical and plumbing services.

Electrical installations should meet all requirements of I.S.10101^[3]. Xtratherm Xtrowall XO/XWP Partial Fill Cavity Board shall not be placed in direct contact with electrical cables or hot water pipes (max. temp 80°C).

3.5 CE MARKING

The manufacturer has taken the responsibility of CE marking Xtratherm Xtrowall XO/XWP product in accordance with the Construction Products Regulation No. 305/2011 and harmonised standard I.S. EN 13165-1^[7]. An asterisk (*) appearing in this Certificate indicates that data shown is an essential characteristic of the product and declared in the manufacturer's Declaration of Performance (DoP). Reference should be made to the latest version of the manufacturer's DoP for current information on any essential characteristics declared by the manufacturer

4.1 BEHAVIOUR IN FIRE

4.1.1 The Certificate holder has declared a Class C-s2, d0 * reaction to fire classification for the product in accordance with I.S. EN 13501-1^[16]. The product is suitable for use for the thermal insulation of new cavity walls, where both leaves are constructed of either masonry or concrete or a combination thereof, as defined in Section 3 of this certificate. The Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system may be used in buildings of any purpose group without the need for cavity barriers, provided the construction complies with TGD to Part B (including Diagram 17) of the Irish Building Regulations.

4.1.2 Combustibility– Xtrowall XO/XWP partial fill cavity boards are combustible and must be protected from naked flames and other ignition sources during and after installation.

4.1.3 Toxicity – Negligible when used in a cavity wall situation. As Xtratherm Xtrowall XO/XWP Partial Fill Cavity Boards are manufactured without CFC or HCFC gases, there is no release of such gas on burning.

4.2 CONDENSATION RISK

The Xtratherm Xtrowall XO/XWP partial fill boards which incorporate composite foil facing on both sides of the insulation, will provide significant resistance to water vapour transmission, however the joints between boards will facilitate the passage of water vapour under normal conditions of temperature and humidity.

For the purposes of calculation, the vapor water vapour resistivity of the insulation is given in Table 2. The vapour resistance for the foil facing for its actual thickness is given in Table 2.

4.2.1 Internal Surface Condensation

When improving the thermal performance of the external envelope of a building through the use of Cavity Wall Insulation, designers need to consider the impact of these improvements on other elements of the building. As referenced in Cl. 4.5 of this Certificate, thermally bridged sections of the envelope such as window jambs, sills, heads, internal wall and floor junctions and eaves may experience a lower level of increased thermal performance.

As a result, best practice should be adopted in order to limit the risk of internal surface condensation which can result in dampness and mould growth. When site limiting factors give rise to substandard levels of insulation at bridged junctions, guidance should be sought from the Certificate holder as to acceptable minimum requirements.

Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 0.7 W/m²K. At any point and the junctions with other elements are designed in accordance with the guidance referenced in Cl.4.5 of this certificate.

Walls will limit the risk of surface condensation adequately when the thermal transmittance (U value) of the wall does not exceed 1.2 W/m²K at any point. Further guidance may be obtained from BS 5250^[4].

4.2.2 Interstitial condensation

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 in the internal wall leaf.

When a potential interstitial condensation risk is identified at design stage, a condensation risk analysis must be carried out.

A transient hygrothermal (condensation) risk analysis in accordance with I.S. EN 15026^[18] can be used to predict one dimensional transient heat and moisture transfer in multi-layer building envelope components subjected to non-steady climate conditions on either side. When a problem is identified, the design shall be modified as appropriate to reduce the risk of interstitial condensation to acceptable levels. Alternatively, a steady state condensation risk analysis can be performed to I.S. EN ISO 13788^[19]. Further guidance may be obtained from BS 5250^[4].

4.3 THERMAL INSULATION

Calculations of the thermal transmittance (U-value) of specific constructions should be carried out in accordance with IS EN ISO 6946^[20] using the declared thermal conductivity* (λ -value) of 0.020 W/m.K as outlined in Table 2 of this certificate.

The U-value of a construction will depend on the insulation thickness, number and type of fixings, the insulation value of the substrate masonry and its internal finishes. Examples of U-value calculations are given in Table 3.

A full listing of U-value calculations, along with AutoCAD building details on which calculations are based are available from the certificate holder on request. End users should seek guidance from the certificate holder on U-values that can be achieved.

Characteristics of the Xtratherm Xtrowall XO/XWP Cavity Wall Insulation PIR board			
Characteristics	Test Standard	Performance	Harmonised Standard
Thermal Conductivity	EN 12667	0.020 W/(m.K) *	I.S. EN 13165
Reaction to fire	EN 13501	Euroclass C-s2, d0 *	
Thickness	EN 823	T2	
Length and Width	EN 822	<1000mm ±5mm* 1000mm – 2000mm ±7.5mm* 2001mm – 4000mm ±10mm* >4000mm ±15mm*	
Squareness	EN 824	S _b ≤ 5mm*	
Flatness	EN 825	Length: ≤2.5mm* Area ≤ 0.75m ² Deviation ≤5mm* Area > 0.75m ² Deviation ≤10mm*	
Dimensional Stability 48h, 70°C, 90% R.H.	EN 1604	DS (70,90)4*	
Dimensional Stability 48h, -20 °C	EN 1604	DS (-20, -)2*	
Compressive strength	EN 826	CS(10/y)100*	
Foil surface emissivity	EN 15976	0.03	
Insulation resistivity	EN 12086	300 MN·s·g ⁻¹ ·m ⁻¹	
Foil-facing resistance		7000 MNs/g	
* Indicates that the data shown is taken from the manufacturer's Declaration of Performance. Reference should be made to the latest version of the manufacturer's DoP for-current information on any essential characteristics declared by the manufacturer.			

Table 2

The product can contribute to maintaining continuity of thermal insulation at junctions between elements and around openings. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in the DHPLG publication Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details.

4.4 LIMITING THERMAL BRIDGING

The linear thermal transmittance ψ (Psi) describes the heat loss associated with junctions and around openings. The certificate holder has carried out ψ -value calculations for a wide range of thermally bridged junctions for new build. A full listing of ψ -value calculations, along with AutoCAD building details on which calculations are based, are available from the certificate holder on request.

For window jambs, door reveals and all building junctions, when shown to be equivalent or better than junctions detailed in the DHPLG publication Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details, then it is acceptable to use the linear thermal transmittance values outline in Table D1 of Appendix D of TGD to Part L of the Building Regulations 1997 to 2019 .

When all bridged junctions within a building comply with the requirements of Table D1 of appendix D of TGD to Part L, the improved 'y' factor of 0.08 can be entered into the Dwelling Energy Assessment Procedure (DEAP) Building Energy Rating (BER) calculation.

Where either of the above options are shown to be valid, or when the required values cannot be achieved, all relevant details should be recorded on the 'Certificate of Compliance' for that project for use in future BER calculations.

Ψ -values for other junctions outside the scope of this certificate should be assessed in accordance with the BRE IP1/06^[5] and BRE Report BR 497^[6] in accordance with appendix D of TGD to Part L of the Building Regulations 1997 to 2019 .

All thermal modelling calculations shall be performed as required by registered members of the NSAI's thermal modellers scheme.

4.5 DURABILITY

Xtratherm Xtrowall XO/XWP Partial Fill Cavity Board are rot-proof non-toxic and durable. As cavity wall insulation, the Xtratherm Xtrowall Plus XO/XWP Partial Fill Cavity wall insulation system is judged to have a design life compatible with the building in which they are used.

4.6 MAINTENANCE

As the product is confined and protected within the wall cavity it will remain durable without the necessity for maintenance.

4.7 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:

- Density
- Water vapour transmission
- Dimensional accuracy
- Dimensional stability
- Thermal conductivity
- Condensation risk analysis
- Efficiency of the construction process

Table 2 shows the manufacturers declared values for essential characteristic of the Xtrowall XO/XWP boards.

4.8 OTHER INVESTIGATIONS

- Existing data on product properties in relation to fire, toxicity, environmental impact and on the ability of the installed system to limit thermal bridging was assessed.
- 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.
- Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.
- Condensation risk analysis of the system used in various constructions were performed.

Table 3: External Masonry Walls – Estimated U-Values W/m²K

Cavity type	Partial Fill Cavity Board Thickness ¹		
	70mm [§]	110mm	150mm
Rendered Block Cavity wall – Wall Type I	0.22	0.15	0.12
Brick cavity wall – Wall Type II	0.21	0.15	0.11

Note 1: The construction of walls with cavities in excess of 110mm wide requires adjustments to lintels, wall ties, cavity barriers, etc. It is therefore necessary that cavity walls are adequately designed in respect of structural stability and fire safety in accordance with Parts A and B of the Irish Building Regulations, 1997 to 2019.

Note 2: The U-values above includes allowances for stainless steel wall ties of 3.3mm Ø @ 3 per m² for cavity's 76-100mm wide and 3.3mm Ø @ 4.9 per m² for cavity's 101-150mm wide All wall ties fully penetrate the insulation layers. The designer must ensure that sufficient structural calculations are carried out where the densities or centres of wall ties specified fall outside the basic requirements of I.S. EN 1996-1-1^[2] or BS 845-1^[9].

Wall type I - 19mm external render on 100mm/cavity/100mm block cavity wall with 12.5mm internal plasterboard (dabbed fixed without air gap or insulation). Cavity partially filled with insulation thicknesses as above and a residual cavity as per ⁻¹ below.

Wall Type II- 102.5mm external brick /cavity/100mm block cavity wall with 12.5mm internal plasterboard (dabbed fixed without air gap or insulation). Cavity partially filled with insulation thicknesses as above and a residual cavity as per ⁻¹ below.

1 Calculated U-Values are based on the manufacturers declared Thermal Conductivity value of 0.020 W/(m.K)* for the Xtratherm Xtrowall XO/XWP Partial Fill Cavity Board and a residual cavity (Low E) of 40mm.

§ Where U-value provided in this table do not achieve the backstop elemental U-values provided for in TGD to Part L of the Building Regulations, additional measure will need to be considered. A condensation risk analysis should be performed when additional insulation measures are taken.

5.1 National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this Certificate and in accordance with the manufacturer's instructions and usual trade practice. This Certificate shall remain valid for five years from latest date of revision so long as:

- (a) the specification of the product is unchanged.
- (b) the Building Regulations 1997 to 2019 and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.
- (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.
- (d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.
- (e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.
- (f) the registration and/or surveillance fees due to NSAI Agrément are paid.

5.2 The NSAI Agrément mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the NSAI Agrément mark and certification number and must remove them from the products already marked.

5.3 In granting Certification, the NSAI makes no representation as to;

- (a) the absence or presence of patent rights subsisting in the product/process; or
- (b) the legal right of the Certificate holder to market, install or maintain the product/process; or
- (c) whether individual products have been manufactured or installed by the Certificate holder in accordance with the descriptions and specifications set out in this Certificate.

5.4 This Certificate does not comprise installation instructions and does not replace the manufacturer's directions or any professional or trade advice relating to use and installation which may be appropriate.

5.5 Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act 2005, or of any other current or future common law duty of care owed by the manufacturer or by the Certificate holder.

5.6 The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.

5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

NSAI Agrément

This Certificate No. **20/0422** is accordingly granted by the NSAI to **Xtratherm Ltd.** on behalf of NSAI Agrément.

Date of Issue: **10th July 2020**

Signed



Seán Balfe

Director of NSAI Agrément

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément, NSAI,

1 Swift Square, Northwood Business Park, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800.

Fax: (01) 807 3842. www.nσαι.ie

Revisions:

7th January 2021: General revisions

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