

**NSAI**  
Agrément

**IRISH AGRÉMENT BOARD  
CERTIFICATE NO. 08/0324**

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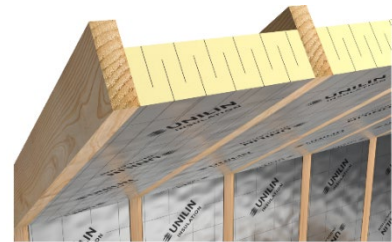
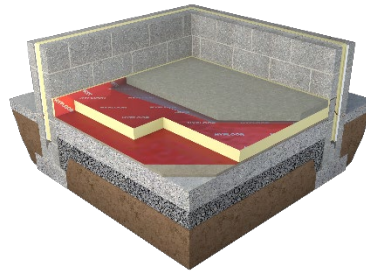
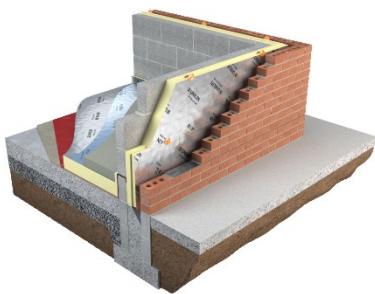
W: [www.unilininsulation.ie](http://www.unilininsulation.ie)

## Unilin Cavity-Plus, Hyffloor & Rafterloc Insulation Boards

### Isolation Wärmedämmung

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

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 and subsequent revisions**.



#### PRODUCT DESCRIPTION:

This Certificate relates to the following products:

- Unilin Cavity-Plus Partial Full Cavity Wall Insulation Board (Detail Sheet 1)
- Unilin Hyffloor Underfloor Insulation Board (Detail Sheet 2)
- Unilin Rafterloc Variable Width Pitched Roof Board (Detail Sheet 3)

This Certificate certifies compliance with the requirements of the Building Regulations 1997 and subsequent revisions.

This Certificate is a confirmation of BBA Certificate No. 07/4407, 07/4406 and 07/4402 issued by the British Board of Agrément, PO Box 195, Bucknalls Lane, Garston, Watford WD25 9BA.

#### MANUFACTURE AND MARKETING:

The product is manufactured and marketed by:

Unilin Insulation Ireland Ltd,  
Kells Road,  
Navan,  
Co. Meath,  
Ireland

Tel: +353 (46) 90 66050

Email: [tech.ui@unilin.com](mailto:tech.ui@unilin.com)

W: [www.unilininsulation.ie](http://www.unilininsulation.ie)

Part One / Certification

#### 1.1 ASSESSMENT

Readers are advised to check that this Certificate has not been withdrawn or superseded by a later issue by contacting NSAI Agrément, NSAI, Santry, Dublin 9 or online at <http://www.n sai.ie>

In the opinion of NSAI Agrément, the Unilin insulation products described in this Certificate, if used in accordance with this Certificate, meets the requirements of following clauses of the Building Regulations:

**Part D – Materials and Workmanship**

**D3 – Proper Materials**

**D1 – Materials and Workmanship**

The Unilin Cavity-Plus, Hyfloor and Rafterloc Insulation Boards comprised of ‘proper materials’, i.e. materials which are fit for their intended use and for the conditions in which they are to be used.

**Part A – Structure**

**A1 – Loading**

**Part B – Fire Safety**

**B3 – Internal Fire Spread (Structure)**

**C4 – Resistance to Weather and Ground Moisture**

**Part F – Ventilation**

**F2 – Condensation in Roofs**

**Part J – Heat Producing Appliances**

**J3 – Protection of Building**

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

**L1 - Conservation of fuel and energy**

**2.3 DELIVERY, STORAGE AND MARKING**

Unilin insulation boards are supplied in polyethylene shrink-wrapped packs. Each pack carries a label with the product description, product characteristics, manufacturer’s name, NSAI Agrément identification mark

Part Two / Technical Specification and Control Data

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**2.1 PRODUCT DESCRIPTION**

Each of the Unilin insulation products is given a detailed description in the relevant Detail Sheet.

**2.2 MANUFACTURE**

The Unilin insulation products described in this Certificate are manufactured from a formulation of chemicals, which is poured onto the foil facers subsequently autohesively bonded to the foam core during manufacture, and then cut to the prescribed width and length.

Quality control checks include board dimensions, squareness, flatness, alignment of facers, density, compressive strength and thermal conductivity.

and NSAI Agrément Certificate number for the system.

Boards must be protected from prolonged exposure to sunlight, should be stored under cover in their original wrapping, not in contact with ground moisture and raised above ground level. If boards are stored outside, they should be raised above ground level and not in contact with ground moisture. Care must be taken to avoid contact with solvents and with materials containing volatile organic components such as coal tar, and newly treated timber. The boards must not be exposed to a naked flame or other ignition sources.

**B4 – External Fire Spread**

Unilin Rafterloc will not affect the external fire rating of the roof in which it is incorporated.

**Part C – Site Preparation and Resistance to Moisture**

Part Three / Design Data

**3.1 GENERAL**

This matter is dealt with for each product in the relevant Detail Sheet.

**3.2 CE MARKING**

The manufacturer has taken the responsibility of CE marking the products in accordance with harmonised standard I.S. EN 13165:2012+A2:2016, Thermal insulation products for buildings - Factory made rigid polyurethane foam (PU) products - Specification. An asterisk (\*) appearing in this Certificate indicates that data shown is given in 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.

#### **4.1 BEHAVIOUR IN FIRE**

Each Detail Sheet contains the relevant information.

#### **4.2 WATER VAPOUR PENETRATION AND CONDENSATION RISK**

Each Detail Sheet contains the relevant information.

#### **4.3 THERMAL INSULATION**

Each Detail Sheet contains the relevant information.

#### **4.4 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:**

- Density
- Water vapour transmission
- Long term water absorption
- Dimensional accuracy
- Compressive and cross breaking strength
- Dimensional stability
- Thermal conductivity
- Efficiency of the construction process

#### **4.5 OTHER INVESTIGATIONS**

- (i) Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on mechanical strength/stability and durability were assessed.
- (ii) 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.
- (iii) Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.
- (iv) A condensation risk analysis was performed.

**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 date of issue so long as:

- (a) the specification of the product is unchanged.
- (b) the Building Regulations 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. **08/0324** is accordingly granted by the NSAI to **Unilin Ltd.** on behalf of NSAI Agrément.

Date of Issue: **October 2008**

**Signed**



**Kevin D. Mullaney**  
**Director of Certification, NSAI**

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément, NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. [www.nsai.ie](http://www.nsai.ie)

**Revisions:**

**April 2010:** Inclusion of Hyfloor and Rafterloc products.

**January 2018:** Product specification updated to reflect manufactures Declaration of Performance.

**13<sup>th</sup> January 2021:** General revision

**06<sup>th</sup> October 2023:** Product Rebranding

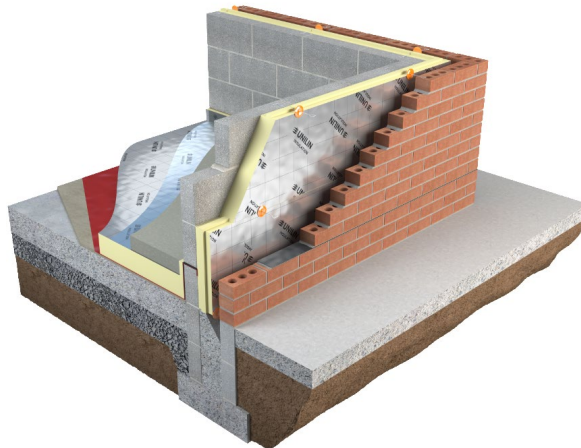


# NSAI

Agrément

CERTIFICATE NO. 08/0324  
DETAIL SHEET 1

## Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board



### PRODUCT DESCRIPTION

This Detail Sheet relates to Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board, as defined in NSAI Agrément Certificate 08/0324. Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board is a rigid polyisocyanurate modified polyurethane foam board manufactured in accordance with I.S. EN 13165:2012+A2:2016, *Thermal insulation products for buildings - Factory made rigid polyurethane foam (PU)*

*products - Specification* with a foil laminate facing on both sides.

### USE:

The product is used for the thermal insulation of new external cavity masonry walls. It also facilitates the control of surface and interstitial condensation in walls.

Part One / Certification

1

### 1.1 ASSESSMENT

In the opinion of NSAI Agrément, Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board if used in accordance with this Detail Sheet meets the requirements of the Building Regulations as indicated in Section 1.2 of Certificate 08/0324.

### 1.2 BUILDING REGULATIONS

This matter is dealt with in NSAI Agrément Certificate 08/0324.



**2.1 PRODUCT DESCRIPTION**

Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board consists of a rigid polyisocyanurate modified polyurethane foam board manufactured in accordance with I.S. EN 13165:2012+A2:2016, *Thermal insulation products for buildings - Factory made rigid polyurethane foam (PU) products - Specification*. Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board also includes an optional pre-formed insulation panel that forms a 90° corner to effectively insulate a junctions that is normally vulnerable to thermal bridging and cold spots.

Table 1 shows the Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board product range.

<b>Length</b>	1200mm
<b>Width</b>	450mm
<b>Thickness</b>	60, 80, 100mm
Other sizes are available	

**Table 1: Product Range**

**2.2 INSTALLATION**

A section of the inner leaf is built with the first row of ties at not greater than 600mm horizontal centres. This first row of insulation boards should be commenced 1 block below DPC level to provide improved edge insulation for the floor, as required by TGD to Part L of the Building Regulations. It is recommended that the wall ties are not placed directly on the DPC.

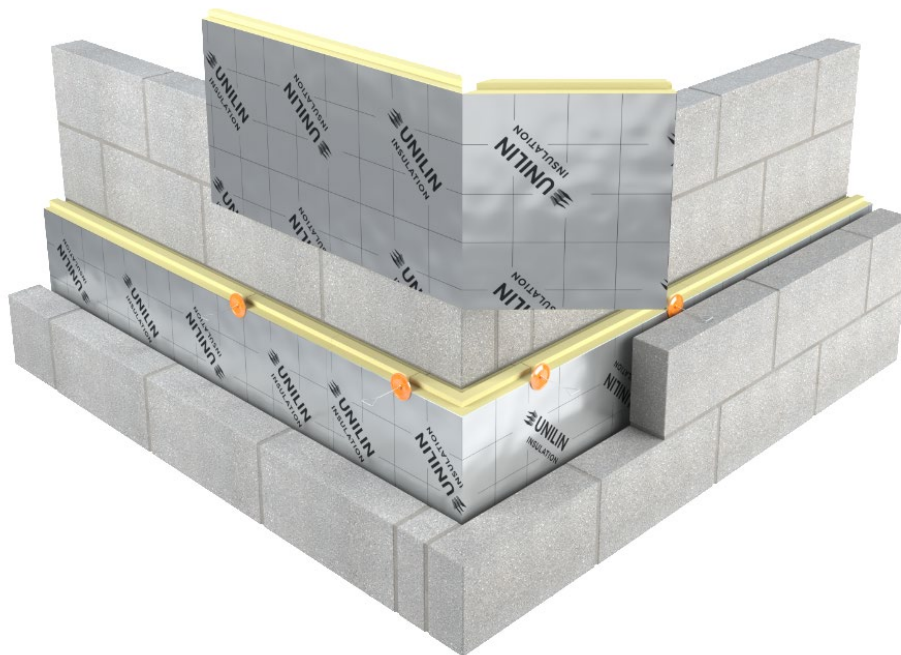
The leading leaf is built up to the required height, with wall ties placed at a vertical height of 450mm ensuring the drip of the tie is located halfway across the residual cavity width. Excess mortar is cleaned from the cavity face of the leading leaf, and the boards are placed on the wall ties, behind the retaining clips. The second row of wall ties is fitted to retain the tops of the boards. It is essential that all wall ties slope downwards towards the outer leaf and at centres not exceeding 900mm to ensure that each board is secured at a minimum of 3 points. Additional wall ties may be required at corners, junctions and cut board ends. The other leaf is then built up to the level of the top of the boards. Use of a cavity board will protect the installed board edges and help to keep the cavity clean as the following leaf is built.

Table 2 shows typical wall tie spacing.

Cavity Width	Horizontal Spacing mm	Vertical Spacing mm	No. of Wall Ties per m <sup>2</sup>
76 – 110	750	450	3.0
111 - 150	450	450	4.9

**Table 2: Maximum Spacing of Wall Ties**

Unilin reveal boards are pre-cut to tightly fit around reveals at window and door openings, allowing ties to be positioned 150mm in from the edge of the reveal and at every block joint.



**Figure 1: Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board installed with block inner and outer leaf**

### 3.1 GENERAL

Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board, when installed in accordance with this Detail Sheet, is effective in reducing the U-value (thermal transmittance) of new external masonry cavity walls, using clay 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 having regard to the Driving Rain Index. Accredited construction details should be followed for limitation of thermal bridging (see Section 1.3.3.2 of TGD to Part L of the Building Regulations).

Buildings subject to the relevant requirements of the Building Regulations should be constructed from masonry units designed in accordance with I.S. EN 1996-1-1:2005+A1:2012, *Eurocode 6 - Design of masonry structures - Part 1-1: General rules for reinforced and unreinforced masonry structures*, I.S. EN 1996-2:2006+NA:2010, *Design of masonry structures - Part 2: Design considerations, selection of materials and execution of masonry (Including Irish National Annex)* and S.R. 325:2013+A:2018/AC:2019 *Recommendations for the design of masonry structures in Ireland to Eurocode 6*.

The use of a cavity board or cavity during construction is recommended to prevent accumulation of mortar droppings on the top edge of the Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board and to prevent bridging of cavity by mortar droppings.

It is recommended that installation be carried out to the highest level on each wall. Where appropriate the top edge of the insulation should be protected by a cavity tray. On site trimming of boards may be necessary to achieve this.

Where a nominal residual cavity width of 40mm is maintained, Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board are suitable for use in any exposure conditions, in building up to 12m in height.

For buildings over 12m and up to 25m in height the exposure factor should be considered by the designer.

It is important to ensure during installation that:

- Wall ties and fixings are installed correctly and are thoroughly clean
- Excess mortar is cleaned from the inside face of the leading leaf and any debris is removed from the cavity.
- Mortar droppings are cleaned from the exposed edges of installed slabs.

Data obtained by NSAI Agrément confirms that a masonry wall incorporating Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board will not transmit water to the inner leaf.

Data obtained by NSAI Agrément also demonstrates that Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board does not absorb water by capillary action. When the product is used in situations where it bridges the DPC in walls, dampness from the ground will not pass through, provided the cavity is taken down to at least 150mm below the level of the lowest DPC.

A minimum residual cavity width of 40mm should be maintained where possible.

### 3.2 CE MARKING

The manufacturer has taken the responsibility of CE marking the products in accordance with harmonised standard I.S. EN 13165:2012+A2:2016, *Thermal insulation products for buildings - Factory made rigid polyurethane foam (PU) products - Specification*. An asterisk (\*) appearing in this Certificate indicates that data shown is given in 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.

I.S. EN 13165:2012 Essential characteristics for Unilin Cavity-Plus Partial Fill		
Property	Declared Value	Test Method
Thermal conductivity	0.021*	EN 12667
Reaction to fire	NPD*	EN 13501-1
Thickness	T2*	EN 823
Length and width	<1000mm ± 5mm* 1000 to 2000mm ± 7,5mm* 2001 to 4000mm ± 10mm* >4000mm ± 15mm*	EN 822
Squareness	S <sub>b</sub> ≤ 5mm/m*	EN 824
Flatness	Length: ≤2,5m* Area ≤ 0.75 m <sup>2</sup> : Deviation ≤ 5mm* Area > 0.75 m <sup>2</sup> : Deviation ≤ 10mm*	EN 825
Dimensional stability	DS (70,90)4*	EN1604
Dimensional stability	DS (-20,-)2*	EN1604
Compressive Strength	CS (10/Y) 120*	EN 826

Table 3: Physical Properties of Unilin Cavity-Plus Partial Fill



#### 4.1 BEHAVIOUR IN FIRE

Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board may be used in buildings of any purpose group in a wall in which the cavity intercommunicates with another such cavity, and may be unlimited in extent in respect of the provision of barriers provided the walls comply with Part B3, Diagram 17 (Cavity walls excluded from provisions for cavity barriers) of the TGD Part B, Building Regulations or Diagram 12 of TGD to Part B Volume 2 of the Building Regulations, as follows:

- a) The wall consists of two leaves, each being not less than 75mm thick and constructed of non-combustible materials;
- b) The cavity does not exceed 150mm in width and is closed by a cavity barrier at the top of the wall and at the top of any opening through any leaf of the wall, and
- c) 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, DPCs or wall ties
  - thermal insulating material
  - meter boxes which require an opening in the outer leaf of not greater than 800 x 500mm and do not penetrate the inner leaf except through a sleeve of not more than 80 x 80mm which is fire stopped where it passes through the inner leaf.

Combustibility – Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board has a reaction to fire classification of NPD to IS EN 13501-1. The boards are combustible and must be protected from naked flames and other ignition sources during and after installation.

Spread of flame within the cavity – In an unventilated cavity the amount of air will be insufficient to support combustion and flame spread is unlikely to occur.

Toxicity – Negligible when used in a cavity wall situation.

##### 4.1.1 J3 – Protection of Building

Combustible wall insulation material shall generally be separated by solid non combustible material not less than 200mm thick, from any heating appliance or from any flue pipe or opening to a heating appliance. Particular details are given in TGD Part J to the Building Regulations. It should also be separated by 40mm from the external surface of a masonry chimney. For chimneys separation between this product and the external surface of the chimney shall be determined in accordance with TGD Part J to the Building Regulations.

#### 4.2 WATER PENETRATION

Capillary Action – The closed cell structure does not allow water uptake by capillary action.

Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board, when used in accordance with this Detail Sheet, presents no significant risk of water penetration.

#### 4.3 WATER VAPOUR PENETRATION AND CONDENSATION RISK

Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board has a water vapour resistance greater than 100MNs/g when tested in accordance with BS 4370-2:1993 *Methods of test for rigid cellular materials – Methods 7 to 9*. It has significant resistance to the passage of water vapour when used in conventional masonry cavity wall construction. This obviates the risk of surface condensation and presents no significant risk of damage from interstitial condensation. Correct use of the heating and ventilation system is important. When insulating buildings, the recommendations of BS 5250:2021 *Code of practice for control of condensation in buildings* should be followed to minimise the risk of condensation within the building elements and structures.

When building elements do not follow the principles of BS 5250:2021, a robust hygrothermal assessment to either I.S. EN 15026:2007 or I.S. EN ISO 13788:2012 must be considered.

#### 4.4 THERMAL INSULATION

The aged thermal conductivity ' $\lambda_{90/90}$ ' value of Unilin Cavity-Plus Partial Fill Cavity Wall Insulation Board, when measured in accordance with IS EN 12667:2001, and calculated in accordance with Annex C of I.S. EN 13165:2012+A2:2016 is 0.021\* W/m.K. The foil face has a low emissivity value of 0.05. Air cavities adjacent to surfaces with a low emissivity will have increased thermal resistance which will in turn reduce heat loss. The U-value of a wall construction will depend on the cavity width, the thickness of insulation and the thermal conductivity and thickness of all other building materials used in the make-up of the wall.

The DoEHLG publication *Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details* gives guidance on limiting cold bridging and should be referred to.

#### 4.5 MATERIALS IN CONTACT WITH ELECTRICAL WIRING

Electrical installations should be in accordance with all requirements of I.S 10101. It is recommended that cables should not be buried in the insulation and carried in a conduit. In relation to recessed spotlights and other luminaries, I.S 10101 requires they be not less than the minimum distances from combustible materials.

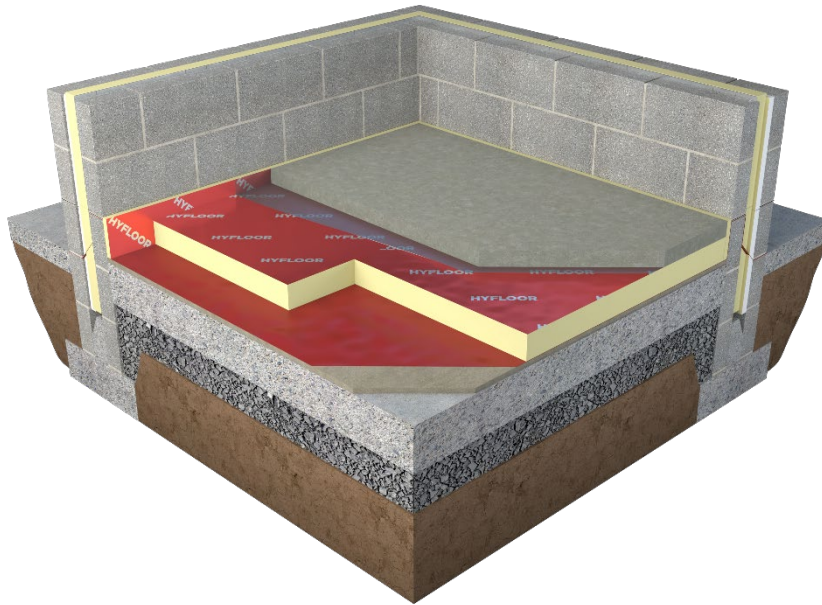


# NSAI

Agrément

CERTIFICATE NO. 08/0324  
DETAIL SHEET 2

## Unilin Hyfloor Underfloor Insulation



### PRODUCT DESCRIPTION:

This Detail Sheet relates to Unilin Hyfloor Underfloor Insulation, as defined in NSAI Agrément Certificate 08/0324. Unilin Hyfloor Underfloor Insulation is a rigid polyisocyanurate modified polyurethane foam board manufactured in accordance with I.S. EN 13165:2012+A2:2016, *Thermal insulation products for buildings - Factory made rigid polyurethane foam (PU) products - Specification* with a foil laminate facing on both sides.

### USE:

Unilin Hyfloor Underfloor Insulation is used for the thermal insulation in ground supported and suspended floors and may be installed:

- Below a concrete floor slab;
- Below a cement based floor screed on a concrete slab with a hardcore base;
- Below a wood-based floor, e.g. tongue-and-groove plywood 16mm thick (minimum) or OSB 18mm thick (minimum)
- Between the joists of a suspended timber floor.

Part One / Certification

1

### 1.1 ASSESSMENT

In the opinion of NSAI Agrément, Unilin Hyfloor Underfloor Insulation if used in accordance with this Detail Sheet, meets the requirements of the Building Regulations as indicated in Section 1.2 of Certificate 08/0324.

### 1.2 BUILDING REGULATIONS

This matter is dealt with in NSAI Agrément Certificate 08/0324.

## 2.1 PRODUCT DESCRIPTION

Unilin Hyfloor Underfloor Insulation consists of a rigid polyisocyanurate modified polyurethane foam board manufactured in accordance with I.S. EN 13165:2012+A2:2016, *Thermal insulation products for buildings - Factory made rigid polyurethane foam (PU) products - Specification* with a foil laminate facing on both sides.

Table 1 shows the Unilin Hyfloor Underfloor Insulation product range.

<b>Length</b>	2400mm
<b>Width</b>	1200mm
<b>Thickness</b>	100mm, 125mm, 150mm*
* Other thicknesses are available	

**Table 1: Product Range**

## 2.2 INSTALLATION

### 2.2.1 General

Installation of Unilin Hyfloor Underfloor Insulation must be in accordance with the Certificate holder's instructions and the requirements of this Certificate. Consideration should be given to the recommendations of CP 102:1973 *Code of practice for protection of buildings against water from the ground*.

All concrete floor surfaces must be smooth, level and flat to within 5mm when measured with a 2m straight-edge. Irregularities greater than this must be removed. Minor irregularities (up to 10mm deep) may be levelled with mortar or thin screed.

In ground-supported concrete floors, the concrete floor slab over which the boards are laid should be left for as long as possible to maximise drying out and dissipation of constructional moisture in accordance with Section 3.1.2 of BS 8203:2001 *Code of practice for installation of resilient floor coverings*.

Where the boards are used over ground supported concrete floor slabs, a suitable damp proof membrane (DPM) in accordance with CP 102:1973 should be laid to resist moisture from the ground. Where the boards are used on hardcore bases under ground supported concrete slabs, the hardcore must be compacted and blinded with a thin layer of sand before application of the DPM and boards.

Where a screed or concrete slab is laid over the product, vertical upstands of insulation should be provided in accordance with accepted details.

In suspended timber floors, the insulation boards are installed between the floor joists.

The boards can be cut using a sharp knife or fine-toothed saw to fit around service penetrations.

### 2.2.2 Laying Below the Floor Slab

Where Unilin Hyfloor Underfloor Insulation is used below the floor slab, lay the hardcore in layers (150mm minimum – 225mm maximum) which should be well-compacted, with the surface blinded with quarry dust or sand to provide a suitable surface for laying a DPM. The DPM (minimum 1200 gauge polythene) should be laid over the blinding with joints taped to prevent the passage of ground moisture. The DPM should be carried up the wall until it meets and seals with the DPM.

Unilin Hyfloor Underfloor Insulation should be laid using the tongue and groove jointing, and fitted tightly at the edges and around any service penetrations. Spreader boards should be used to protect the boards. Vertical upstands of insulation 25mm thick should be placed at the floor perimeter to minimise thermal bridging.

Care should be taken to avoid damage to the insulation or DPMs and radon barriers as the slab is being poured, and operatives should make use of barrow runs and walkways whilst installation progresses.

### 2.2.3 Laying Below the Floor Screed

Where Unilin Hyfloor Underfloor Insulation is used below the floor screed, the same procedure should be followed ensuring that the floor slab onto which the insulation is being laid is level.

The concrete floor over which the insulation is to be laid should be left as long as possible to maximise drying out in accordance with the relevant recommendations of BS 8203:2017.

The minimum thickness of sand and cement screed is 65mm for domestic construction and 75mm for most other buildings. However, architectural specifications should be consulted.

### 2.2.4 Laying in Suspended Timber Floors

Unilin Hyfloor Underfloor Insulation boards should be cut to fit between the timber joists and be supported by carriers. These may be nails part driven into the side of the joists at selected levels, timber battens or proprietary saddle clips.

Where services need to be accommodated below the floor, Unilin Hyfloor Underfloor Insulation boards can be lowered to provide an insulated duct.

Install flooring grade chipboard, ply or softwood timber flooring directly onto the joists, fixing in the normal manner.

Ensure that the void below the insulated suspended floor is well-ventilated and that the airflow is not restricted by sleeper walls.

### 2.2.5 Incorporation of Services

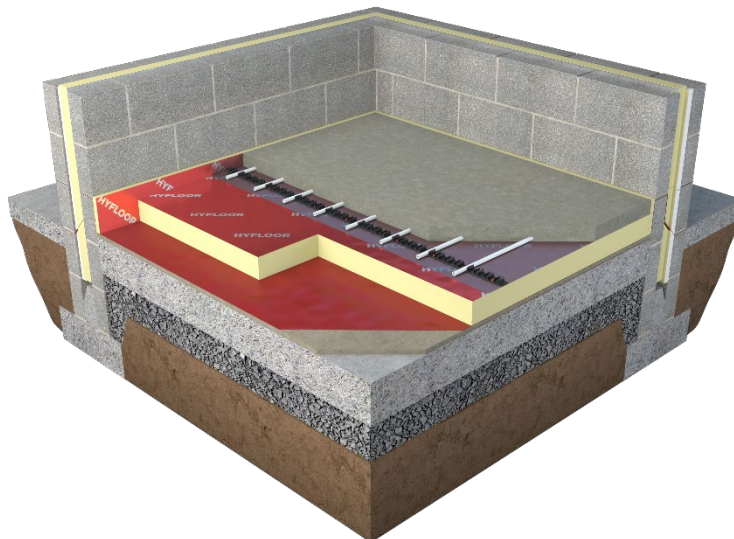
The maximum continuous working temperature of the boards is 100°C. De-rating of electrical cables should be considered where the insulation restricts air cooling of cables.

Where possible, electrical conduits, gas and water pipes or other services should be contained within ducts or channels within the concrete slab. Where this is not possible, the services may be accommodated within the insulation, provided they are securely fixed to the concrete slab. Electrical cables should be enclosed in a suitable conduit. With hot pipes the insulation must be cut back to maintain an air space.

Where water pipes are installed below the insulation they should be pre-lagged. Generally, insulation will be relatively thin so it would not be possible to install pipes within the insulation. Pipes installed above the insulation will not require lagging, although some provision needs to be made for expansion and contraction.

On intermediate/exposed floors all the services should be incorporated beneath the existing floor, above the insulation where possible.

On board overlay floors, in situations where access to the services is desirable, a duct may be formed by mechanically fixing to the floor timber bearers of the same thickness as the insulation to provide support for a particle board cover. Services should be suitably fixed to the floor base and not to the insulation boards.



**Figure 1: Unilin Hyffloor Underfloor Insulation installed below the floor screed incorporating underfloor heating**

### 3.1 GENERAL

Unilin Hyffloor Underfloor Insulation, when installed in accordance with this Detail Sheet, is effective in reducing the 'U' value (thermal transmittance) of new and existing floor constructions.

Ground supported floors incorporating Unilin Hyffloor Underfloor Insulation must include a suitable damp proof membrane laid in accordance with CP 102:1973.

Suspended concrete ground floors incorporating Unilin Hyffloor Underfloor Insulation must include suitable ventilation and void should remain inaccessible.

### 3.2 FLOOR LOADING

The design loadings for self-contained single family dwelling units as defined in I.S. EN 1991-1-1:2002/NA:2013, Eurocode 1: Actions on structures - Part 1-1: General actions - Densities, self-weight, imposed loads for buildings.

Where Unilin Hyffloor Underfloor Insulation is used under a concrete slab, resistance to concentrated and distributed loads is a function of the slab specification.

### 3.3 UNDERFLOOR HEATING SYSTEMS

The maximum continuous working temperature of PIR is 100°C. Unilin Hyfloor Underfloor Insulation is suitable for use with underfloor heating systems.

### 3.4 WATERPROOFING

If an overlay of chipboard, OSB or similar material is to be used in bathrooms or kitchens, a continuous waterproof finish (e.g. vinyl) must be provided to protect it.

## Part Four / Technical Investigations

4

### 4.1 BEHAVIOUR IN FIRE

Combustibility –Unilin Hyfloor Underfloor Insulation has a reaction to fire classification of NPD to IS EN 13501-1. The boards are combustible and must be protected from naked flames and other ignition sources during and after installation. The boards when in proximity to a constructional hearth must be protected by 250mm of solid concrete or as detailed in TGD Part J: Heat Producing Appliances.

Toxicity – Negligible when used in a ground floor construction.

### 4.2 STRENGTH

Unilin Hyfloor Underfloor Insulation when installed in accordance with the manufacturer's instructions, and this Detail Sheet, will resist the loads likely to be met during installation and in service.

### 4.3 RESISTANCE TO MOISTURE

Unilin Hyfloor Underfloor Insulation will not allow moisture to cross the floor construction provided it is installed in accordance with this Detail Sheet.

### 4.4 CONDENSATION RISK

Unilin Hyfloor Underfloor Insulation has a water vapour resistance greater than 100MNs/g when tested in accordance with BS 4370-2:1993 *Methods of test for rigid cellular materials – Methods 7 to 9*. It has significant resistance to the passage of water vapour when used in ground floor construction using a suitable damp proof membrane.

Capillary Action – The closed cell structure does not allow water uptake by capillary action.

### 4.5 THERMAL INSULATION

The aged thermal conductivity ' $\lambda_{90/90}$ ' value of Unilin Hyfloor Underfloor Insulation, when measured in accordance with IS EN 12667:2001, and calculated in accordance with Annex C of IS EN 13165:2012 is 0.021\* W/m.K. The required U-value for ground floors can be obtained with Unilin Hyfloor Underfloor Insulation constructions. The ground floor U-value will depend on the building perimeter/area ratio and the thickness of insulation board provided. Specifiers can use the declared thermal conductivity to calculate a project specific U-value. who are required to calculate the required U-value as indicated in Table 2.

The DoEHLG publication *Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details* gives guidance on limiting cold bridging and should be referred to. When insulation is provided below a concrete slab, perimeter insulation having a minimum thermal resistance of 1.0 m<sup>2</sup>K/W must be provided to limit heat loss due to thermal bridging. Where superior performances at thermally bridged locations are required, designers should engage the services of a NSAI registered thermal modeller.

I.S. EN 13165:2012 Essential characteristics for Unilin Hyfloor Underfloor Insulation		
Property	Declared Value	Test Method
Thermal conductivity	0.021*	EN 12667
Reaction to fire	NPD*	EN 13501-1
Thickness	T2*	EN 823
Length and width	<1000mm ± 5mm* 1000 to 2000mm ± 7,5mm* 2001 to 4000mm ± 10mm* >4000mm ± 15mm*	EN 822
Squareness	$S_b \leq 5\text{mm/m}^*$	EN 824
Flatness	Length: $\leq 2,5\text{m}^*$ Area $\leq 0.75 \text{ m}^2$ : Deviation $\leq 5\text{mm}^*$ Area $> 0.75 \text{ m}^2$ : Deviation $\leq 10\text{mm}^*$	EN 825
Dimensional stability	DS (70,90)4*	EN1604
Dimensional stability	DS (-20,-)2*	EN1604
Compressive Strength	CS (10/Y) 140	EN 826



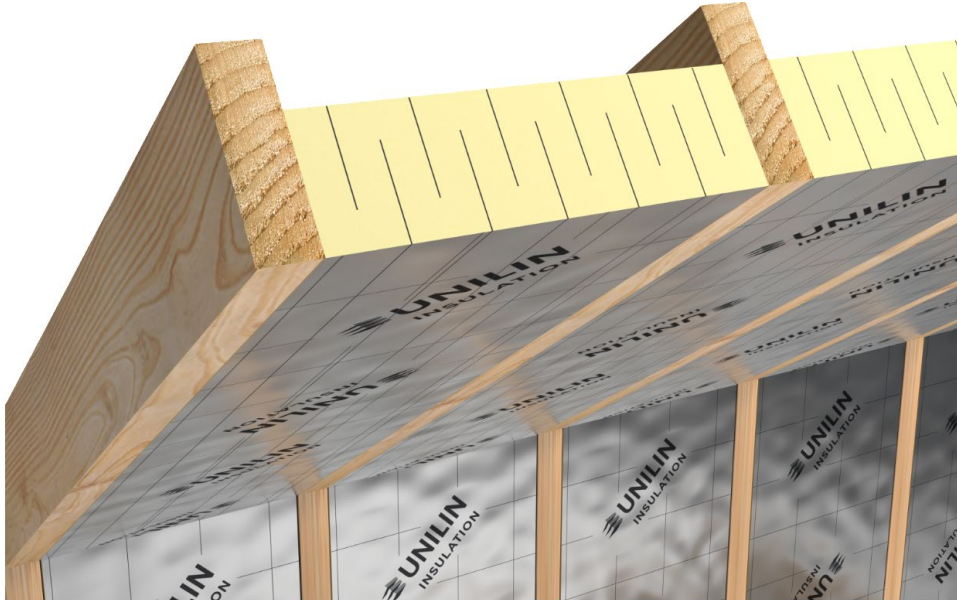


# NSAI

Agrément

CERTIFICATE NO. 08/0324  
DETAIL SHEET 3

## Unilin Rafterloc Variable Width Pitched Roof Board



### PRODUCT DESCRIPTION:

This Detail Sheet relates to Unilin Rafterloc, as defined in NSAI Agrément Certificate 08/0324. Unilin Rafterloc is a rigid polyisocyanurate modified polyurethane foam board manufactured in accordance with I.S. EN 13165:2012+A2:2016, *Thermal insulation products for buildings - Factory made rigid polyurethane foam (PU) products - Specification* with a foil laminate facing on both sides. Unilin Rafterloc features a slotted mechanism that allows the board to lock between the rafters in pitched roof applications.

### USE:

The product is used for the thermal insulation between rafters of pitched and tiled roofs constructed in accordance with SR 82:2017, *Slating and Tiling - Code of Practice*. It also facilitates the control of surface and interstitial condensation in roofs.

Part One / Certification

1

### 1.1 ASSESSMENT

In the opinion of NSAI Agrément, Unilin Rafterloc if used in accordance with this Detail Sheet, meets the requirements of the Building Regulations as indicated in Section 1.2 of Certificate 08/0324.

### 1.2 BUILDING REGULATIONS

This matter is dealt with in NSAI Agrément Certificate 08/0324.



**2.1 PRODUCT DESCRIPTION**

Unilin Rafterloc consists of a rigid polyisocyanurate modified polyurethane foam board manufactured in accordance with I.S. EN 13165:2012+A2:2016, *Thermal insulation products for buildings - Factory made rigid polyurethane foam (PU) products - Specification* with a foil laminate facing on both sides. The boards feature a slotted mechanism that allows the board to lock between the rafters in pitched roof applications.

Table 1 shows the Unilin Rafterloc product range.

<b>Length</b>	1200mm
<b>Width</b>	370mm
<b>Thickness</b>	75, 100, 125, 150mm
Other sizes are available	

**Table 1: Product Range**

**2.2 INSTALLATION**

**2.2.1 General**

Installation must be in accordance with the relevant clauses of SR 82:2017 and the manufacturer’s instructions, and can be carried out in all conditions normal for roof construction.

The boards can be cut using a sharp knife or fine-toothed saw. Unilin Rafterloc boards will not support the weight of operatives and care must be taken during tiling of the roof.

Cavity barriers should be provided at the junction of the external wall and roof space in accordance with the requirements of Part B of the Building Regulations 1997 to 2008.

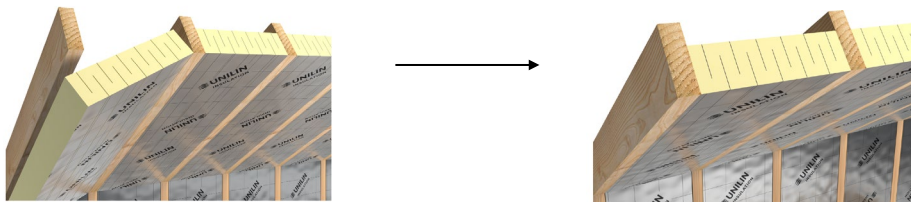
**2.2.2 Procedure – Between Rafter Layer of Insulation**

Following completion of roof cladding, friction fit Unilin Rafterloc insulation to sit flush with the underside of the rafters whilst maintaining the ventilation gap.

If required, the Unilin Rafterloc board can be cut with a trimming knife to fit areas that are closer than the standard spacing. The board should be cut accurately to facilitate tight fitting. Care should be taken to avoid thermal bridging at roof-wall junctions at eaves, gable walls and party walls. Complete installation as described to vertical studding and ceiling collars. A suitable vapour control layer should be fixed to the underside of the rafters at this stage.

**2.2.3 Procedure – Between and Below Rafter Layer of Insulation**

A second layer of NSAI Agrément approved Unilin Pitched Roof XT/PR insulation can be fitted beneath the rafters. The Pitched Roof XT/PR board should be butted tightly against adjoining panels and temporarily fixed to the underside of the rafter with large headed clout nails. A suitable vapour control layer should be provided between the Pitched Roof XT/PR board and the internal finish.



**Figure 1: Installation of Unilin Rafterloc between rafters**

**3. GENERAL**

Unilin Rafterloc when installed in accordance with this Detail Sheet is effective in reducing the 'U' value (thermal transmittance) of new and existing pitched roof constructions. It is essential that such roofs are designed and constructed to prevent moisture penetration having regard to the Driving Rain Index.

Roofs subject to the relevant requirements of the Building Regulations should be constructed in accordance with SR 82:2017. Although Unilin Rafterloc will contribute to the buckling and racking strength of the roof as described in SR 82:2017, normal cross-bracing must be incorporated.

Roof tile underlays must be approved by the manufacturer and be the subject of a current NSAI Agrément Certificate for such use. Underlays should be installed in accordance with, and within the limits of that Certificate.

Moisture entering the roof must be minimised using a minimum of 500 gauge polyethylene with sealed gaps, placed under the inclined ceiling. Gaps in the ceiling should be minimised and service openings should be sealed.

**4.1 BEHAVIOUR IN FIRE**

Combustibility –Unilin Rafterloc has a reaction to fire classification of NPD to IS EN 13501-1. The boards are combustible and must be protected from naked flames and other ignition sources during and after installation.

The use of Unilin Rafterloc will not affect the fire rating obtained by the tiled/slatted roof when assess or tested to BS 476-3:2004 *Fire tests on building materials and structures – Classification and method of test for external fire exposure to roofs.*

Toxicity – Negligible when used in protected roof construction.

**4.2 STRENGTH**

Unilin Rafterloc when installed in accordance with the manufacturer’s instructions, and this Detail Sheet, will resist the loads likely to be met during installation and in service.

**4.3 RESISTANCE TO WIND LOAD**

The resistance to wind uplift depends on many factors peculiar to each project. The effect of wind loading should be calculated in accordance with I.S. EN 1991-1-4, Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions, using the appropriate basic wind speed shown on the map in Diagram 1 of TGD to Part A of the Building Regulations.

Unilin Rafterloc when installed in accordance with Section 2.2 of this Detail Sheet will have sufficient resistance to wind uplift.

**4.4 RESISTANCE TO MOISTURE**

Unilin Rafterloc will not be adversely affected by rain during installation for a limited time scale or by wind driven snow or rain penetrating the tiling in service.

**4.5 CONDENSATION RISK**

The risk of interstitial condensation will be minimal under normal conditions of use. Unilin Rafterloc boards have a high water vapour resistance and when installed in accordance with this Certificate will provide a convection-free envelope of high vapour resistance. In these circumstances, or where a vapour control layer is used, a suitable NSAI Agrément approved vapour permeable roof tile underlay may be laid over the insulation boards without a ventilated air space.

Where high humidity may be expected, a vapour control layer should be used unless a condensation risk assessment in accordance with BS 5250:2021 shows that it is not necessary. The risk of interstitial condensation is greatest when the building is drying out after construction. To prevent condensation problem arising, additional ventilation, other than normally required, may be needed.

**4.6 THERMAL INSULATION**

The aged thermal conductivity ‘λ<sub>90/90</sub>’ value of Unilin Rafterloc, when measured in accordance with IS EN 12667:2001, and calculated in accordance with Annex C of I.S. EN 13165:2012 is 0.023\* W/m.K. U-values for pitched roofs which can be obtained with Unilin Rafterloc constructions are indicated in Table 2.

Rafterloc thickness between rafters	Thickness of insulation below rafters				
	30mm	40mm	50mm	60mm	70mm
75mm	0.23	0.21	0.19	0.18	0.16
100mm	0.20	0.18	0.17	0.16	0.15
125mm	0.18	0.16	0.15	0.14	0.13

**Table 2: Typical U Values using Unilin Rafterloc between rafters @ 400mm centres**

