



# NSAI

Agrément

CERTIFICATE NO. 03/0183  
DETAIL SHEET 4

## Xtratherm Thin-R Thermal Liner (XT/TL Grade)



### PRODUCT DESCRIPTION:

This Detail Sheet relates to Xtratherm Thin-R Thermal Liner, as defined in NSAI Agrément Certificate 03/0183. Xtratherm Thin-R Thermal Liner is a composite panel consisting of a Polyisocyanurate (Polyiso) foam core with composite kraft paper face or trillaminate foil back, bonded to plasterboard for internal applications. Polyiso is a thermoset closed cell rigid foam insulation manufactured in accordance with IS EN 13165:2008 *Thermal insulation products for buildings – Factory made rigid polyurethane foam (PUR) products – Specification*, having regard to the description of Polyisocyanurate (PIR) in paragraph 1 of the scope of the standard. During the manufacturing process, liquid raw materials expanded by blowing agents are applied between the facings.

### USE:

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

Part One / Certification

1

### 1.1 ASSESSMENT

In the opinion of NSAI Agrément, Xtratherm Thin-R Thermal Liner if used in accordance with this Detail Sheet, meets the requirements of the Building Regulations 1997 - 2008 as indicated in Section 1.2 of Certificate 03/0183.

### 1.2 BUILDING REGULATIONS 1997 to 2008

This matter is dealt with in NSAI Agrément Certificate 03/0183.

## 2.1 PRODUCT DESCRIPTION

Xtratherm Thin-R Thermal Liner is a composite panel consisting of a rigid Polyiso foam core with composite kraft paper facing or trilaminate foil back factory bonded to plasterboard. The plasterboard is 9.5, 12.5 or 15mm thick manufactured to BS 1230-1 *Gypsum plasterboard – Specification for plasterboard excluding materials submitted to secondary operations*. Polyiso is manufactured to IS EN 13165:2008. The XT/TL board does not contain either CFC or HCFC gases and has zero Ozone Depletion Potential. Table 1 shows the Xtratherm Thin-R Thermal Liner product range.

<b>Length</b>	2400, 2438, 2600, 2740mm
<b>Width</b>	600, 1200mm
<b>Thickness</b>	25, 38, 45, 50, 55, 65 and 70mm*
<b>Grade</b>	PIR
Other sizes are available subject to quantity	
* Refers to insulation thickness only	

**Table 1: Product Range**

## 2.2 INSTALLATION

### 2.2.1 General

Xtratherm Thermal Liner is for installation on the internal surface of walls and ceilings of new or existing buildings. The fixing method depends on the substrate.

Installation should be in accordance with good drylining practice and the manufacturer's instructions. All installations require careful planning and setting out.

Before fixing the product, sufficient time must be allowed to disperse the solvents contained in wood preservatives and damp proofing treatments where applied.

### 2.2.2 Systems and Fixings

#### Thermal Bridging

Walls should be insulated to full height and returned at door/window reveals to prevent cold bridging. The thickness of Xtratherm Thin-R Thermal Liner at reveals may, if necessary, be reduced to a minimum thickness of 25mm. Services should be fixed in place before drylining commences. The void between the wall and the Xtratherm Thin-R Thermal Liner can accommodate certain services, however the Polyiso insulation should not be chased. The area around any services that penetrate the Xtratherm Thin-R Thermal Liner must be sealed to prevent air leakage and thermal looping.

#### Thermal Looping/Fire Stops

Fire stops must be provided using proprietary methods or by applying a continuous 50mm ribbon of dry wall adhesive to the top and bottom edge of each sheet. A treated timber batten will also suffice.

#### Installation Procedure 1 – Adhesive Dabs

Align Xtratherm Thin-R Thermal Liner on the wall allowing a 20mm expansion joint at the top and bottom of the panel and mark the position of the panel on the wall. Apply adhesive dabs to the wall ensuring a

continuous 50mm ribbon top and bottom to provide firestops. Dabs should be applied in accordance with BS 8212:1995 *Code of practice for dry lining and partitioning using gypsum plasterboard* and BS 8000-8:1994 *Workmanship on building sites – code of practice for plasterboard partitions and dry linings*. Lift the Xtratherm Thin-R Thermal Liner into position using wedges on the floor to position the boards. Apply pressure to the board to level and embed the adhesive. Ensure all gaps are filled with sealant. Building regulations may require the provision of vertical cavity barriers in long runs of lining. Such barriers can be formed using a continuous vertical line running down the centre of the board.

Additional mechanical fixings should be provided to each board applying a minimum of 2 metal fixings, after the adhesive has set, in accordance with BS 8212:1995 and manufacturer's instructions.

#### Installation Procedure 2 – Adhesive Dabs and Battens

Align Xtratherm Thin-R Thermal Liner squarely on the wall allowing a 20mm expansion joint at the top and bottom of the panel and mark the position of the panel on the wall. Fix a pre-treated timber batten horizontally at ceiling level and another 20mm above the finished floor level. Cut strips from the top and bottom insulation backing on the Xtratherm Thin-R Thermal Liner to accommodate the battens. The insulation should be cut back to accommodate an adjoining panel at external corners. Apply adhesive dabs to the back of the panel. Continuous ribbons must also be placed around all service penetrations and openings. Life the Xtratherm Thin-R Thermal Liner into position using wedges on the floor to position the boards. Apply pressure to the board to level and embed the adhesive. Fix the Xtratherm Thin-R Thermal Liner to the top and bottom battens. Screws should be fixed to the timber batten at 150mm centres, at least 12mm in from the board edge. The fixings should penetrate at least 25mm into the batten. Ensure all gaps are filled with sealant.

A minimum of 3 no. metal nailable plugs should be used per sheet.

#### Installation Procedure 3 – Battens Only

Align Xtratherm Thin-R Thermal Liner squarely on the wall allowing a 20mm expansion joint at the top and bottom of the panel and mark the position of the panel on the wall. Fix a pre-treated timber batten horizontally at ceiling level and another 20mm above the finished floor level. Fix vertical battens at max 600mm centres, and additional battens to support all board edges. Ensure the battens are wide enough to offer 20mm support to all four edges of the plasterboard and pack if necessary to level the Xtratherm Thin-R Thermal Liner. Trim all openings with battens. The insulation should be cut back to accommodate an adjoining panel at external corners. Life the Xtratherm Thin-R Thermal liner into position using wedges on the floor to position the panels. Fix the Xtratherm Thin-R Thermal Liner to the battens.

Screws should be fixed to the timber batten at 150mm centres, at least 12mm in from the board edge. The fixings should penetrate at least 25mm into the batten. Ensure all gaps are filled with sealant.

On-site trimming of boards where necessary to maintain continuity of insulation around doors, windows or other opens is easily executed using a fine tooth saw or builder's knife.

Tapered edge boards are jointed and finished in accordance with standard dry lining procedure offering a surface suitable for paper hanging and paint finishes.

Good workmanship and appropriate site procedures are necessary to achieve expected thermal and air tightness performance.

#### Installation Procedure 4 – Ceilings

Xtratherm Thin-R Thermal Liner may be used to line either horizontal or sloped ceilings. All four edges of the boards should be supported by rafters, joists or battens by at least 20mm. This may necessitate the addition of timber noggins where necessary. Large headed clout nails, sheridised nails or drylining screws should be used to fix the boards. Fix the Xtratherm Thin-R Thermal liner to all the rafters at 150mm centres. Fixings should be located at least 12mm in from the board edge, and penetrate at least 25mm into the timber

## Part Three / Design Data

3

### 3. GENERAL

Xtratherm Thin-R Thermal Liner when installed in accordance with this Detail Sheet, is effective in reducing the U-value (thermal transmittance) of new or existing walls and ceilings.

Xtratherm Thin-R Thermal Liner may be used to insulate clay or calcium silicate bricks, concrete blocks, hollow 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.

Buildings subject to the relevant requirements of the Building Regulations 1997 to 2008 should be constructed in accordance with IS 325-1:1986 *Use of masonry – Structural use of unreinforced masonry* and BS 5628-3:2001 *Code of practice for use of masonry – Materials and components, design and workmanship*. Particular attention should be paid to the exclusion of moisture in that the designer should select a construction appropriate to the local wind driven rain index, paying due regard to the design detailing, workmanship and materials to be used. Where reinforced masonry is involved, the design should be in accordance with BS 5628-2:2000 *Code of practice for use of masonry – Structural use of reinforced and prestressed masonry* should be followed where the wall incorporates stone or cast stone.

With dry lining installations forming a void of 20mm or more, services can be incorporated behind the dry lining, making the chasing of the wall unnecessary. When using adhesive systems, or where the services have a greater depth than the void, the wall should be chased rather than the insulation.

All mould or fungal growth should be treated prior to the application of the product.

When bonding is by adhesives, apply adhesive dabs to the wall in accordance with BS 8212:1986 and BS 800-8:1994. Vertical dabs @ 300mm centres, 25mm in from the edge. Dabs 50 – 75mm wide approximately 25mm deep to allow for tamping. Total contact with board area should be 20%. Backgrounds of high suction will behave differently to those of low suction. The Certificate holder's advice should be sought in case of difficulty. Maximum installation height for this system is 3m.

It is very important that manufacturer's instructions regarding the use of recessed lighting with this product should be followed.

## Part Four / Technical Investigations

4

### 4.1 BEHAVIOUR IN FIRE

The plasterboard used in the Xtratherm Thin-R Thermal Liner is deemed to be Class O in accordance with the Building Regulations 1997 to 2008, and so the insulated board qualifies as the highest product performance classification as defined in TGD to Part B of the Building Regulations 1997 to 2008 (Paragraph A10 of Annex A). The insulation component of the board should be isolated from possible sources of combustion.

To achieve this, Xtratherm Thin-R Thermal Liner should be installed in accordance with the following:

- Combustible material shall be separated by solid non-combustible material not less than 200mm thick from a flue pipe to an oil, solid fuel or gas heating appliance as indicated in Section 2 of TGD to Part J of the Building Regulations 1997 to 2008.
- The Xtratherm Thin-R Thermal Liner should be separated by a minimum distance of 150mm from

an oil, solid fuel or gas heating appliance as indicated in Diagram 8 of TGD to Part J of the Building Regulations 1997 to 2008.

- Xtratherm Thin-R Thermal Liner when installed with a residual cavity between the board and the wall, will require the provision of cavity barriers and may be used in buildings of any purpose group provided:
  - (a) Cavity barriers in walls are provided at maximum distances apart of 10m unless a Class 1 material is exposed to the cavity when a spacing of 20m may be adopted.
  - (b) Every such cavity shall be closed by a cavity barrier around the whole perimeter of the wall or ceiling element and around the perimeter of any opening through such elements.
  - (c) Cavity barriers in spaces between a floor and ceiling are provided at maximum distances of 20m for any class of surface exposed to the cavity.
  - (d) Where any wall or ceiling containing a cavity meets another such element, the cavities shall be closed so that they do not communicate with one another.
  - (e) Direction on the provision and spacing of cavity barriers is given in Tables 3.2 and 3.3 of TGD to Part B of the Building Regulations 1997 to 2008.

#### **4.2 WATER PENETRATION**

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

Xtratherm Thin-R Thermal Liner when used in accordance with this Detail Sheet presents no significant risk of water penetration.

#### **4.3 THERMAL INSULATION**

The aged thermal conductivity ' $\lambda_{90/90}$ ' value of Xtratherm Thin-R Thermal Liner, when measured in accordance with IS EN 12667:2001, and calculated in accordance with Annex C of IS EN 13165:2008 is 0.022W/mK. The required maximum U-values for external walls can be obtained with Xtratherm Thin-R Thermal Liner constructions as indicated in Table 3.

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

#### **4.4 MATERIALS IN CONTACT WITH ELECTRICAL WIRING**

Where electrical cables have no option by of running within the insulation component of the Xtratherm Thin-R Thermal Liner, then the cables must be enclosed in a suitable conduit, e.g. rigid PVC, as outlined in the National Rules of the Electro Technical Council of Ireland (E.T. 101).

#### **4.5 CONDENSATION RISK**

Xtratherm Thin-R Thermal Liner has a high vapour resistance and is therefore unlikely to be affected by surface or interstitial condensation, provided all joints between boards are filled and taped in accordance with good dry lining practice. Interstitial condensation analysis for average winter environmental conditions for both hollow blockwork and cavity wall constructions indicate no condensation risk.

When insulating buildings, the recommendations of IS EN 13788 *Hydrothermal performance of building components and building elements – Internal surface temperature to avoid critical surface humidity and interstitial condensation – Calculation methods* should be followed to minimise the risk of condensation within the building elements and structures.

#### **4.6 INFESTATION**

Xtratherm Thin-R Thermal Liner panels do not promote infestation, as there is no food value in the materials used.

#### **4.7 WALL MOUNTED FITTINGS**

The recommendations of the manufacturer should be followed. Any object fixed to the wall, other than lightweight items, e.g. framed pictures, should be fixed through the lining board into the wall behind, using proprietary fixings.

#### **4.8 MAINTENANCE**

Damaged boards can be easily replaced prior to the installation of counter battens. No maintenance of the insulation will be required provided that the plasterboard inner layer remains intact.

#### **4.9 DURABILITY**

Xtratherm Thin-R Thermal Liner boards are rot proof and durable. As internal dry lining, Xtratherm Thin-R Thermal Liner is judged to be stable and will remain effective as an insulation system for the life of the building, so long as it is installed in accordance with this Detail Sheet.

Property	Declared Value	Test Method
Long Term Water Absorption by Immersion	WL(T)2	EN 12087
Dimensional Stability	DS(TH)6	EN 1604
Density	32 kg/m <sup>3</sup>	EN 1602
Compressive Stress	> 140 kPa (> 150 kPa mechanically fixed)	EN 826
Thermal Conductivity	0.022 W/mK	EN 12667
Thermal Resistance		
- 25 mm	1.14 m <sup>2</sup> K/W	
- 38 mm	1.74 m <sup>2</sup> K/W	
- 50 mm	2.28 m <sup>2</sup> K/W	
- 55 mm	2.51 m <sup>2</sup> K/W	
- 65 mm	2.97 m <sup>2</sup> K/W	
- 70 mm	3.20 m <sup>2</sup> K/W	

Thermal resistances shown are for insulation only.

Thermal resistances of plasterboard should be added: 15mm – 0.08K/W; 12.5mm – 0.07K/W; 9.5mm – 0.05K/W

**Table 2: Physical Properties of Xtratherm Thin-R Thermal Liner**

Xtratherm Thin-R Thermal Liner on Dabs			
U-value (W/m <sup>2</sup> K)	0.45	0.37	0.27
On Hollow Block	35mm	50mm	70mm
On Cavity Wall	35mm	45mm	65mm
Xtratherm Thin-R Thermal Liner on Battens			
U-value (W/m <sup>2</sup> K)	0.45	0.37	0.27
On Hollow Block	35mm	45mm	65mm
On Cavity Wall	30mm	40mm	60mm

**Table 3: Thicknesses of Xtratherm Thin-R Thermal Liner Required to Achieve Specified U-values**