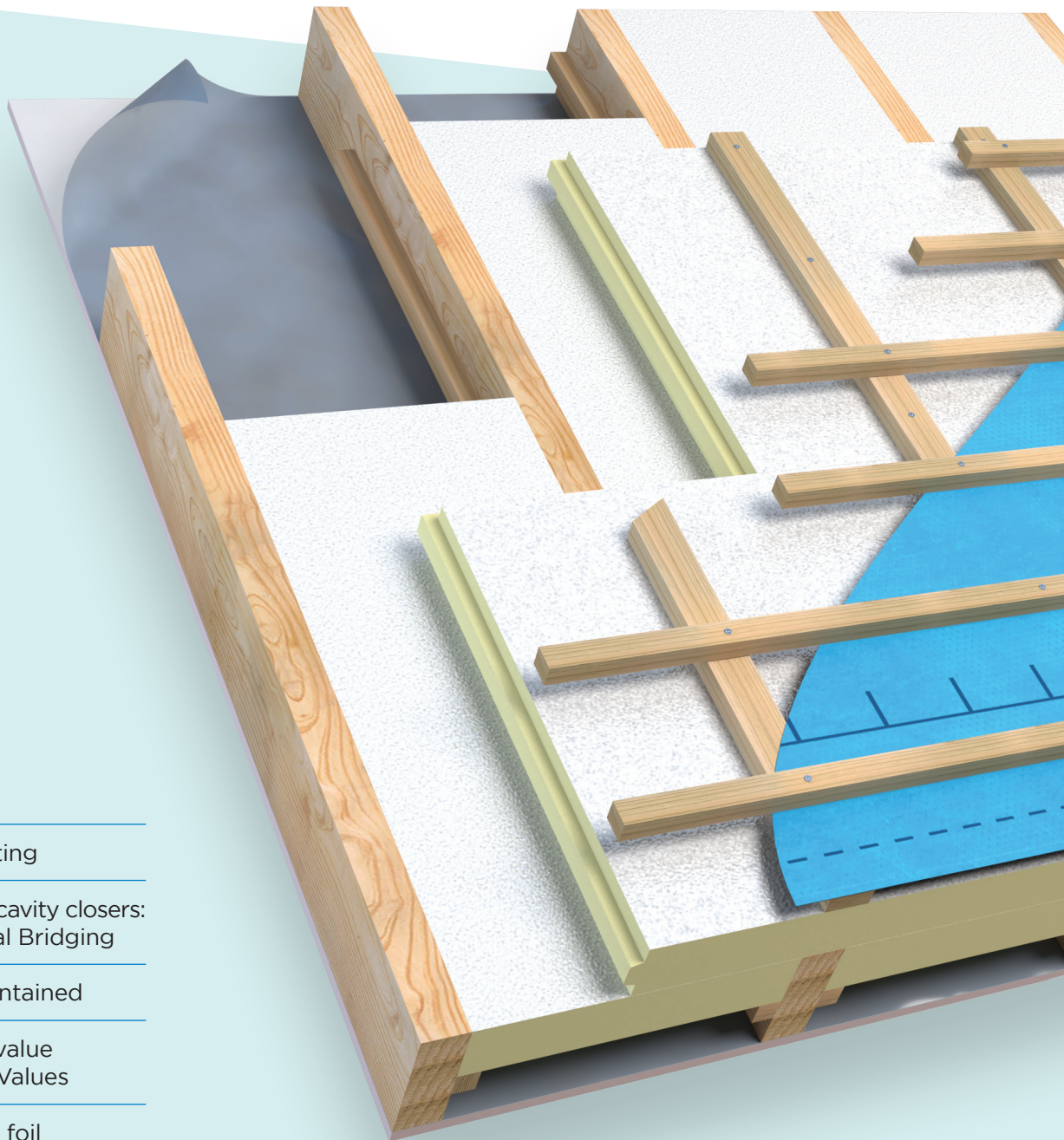


# XTROLINER

SUPERIOR PERFORMANCE  
PIR INSULATION

## Sarking Warm Roof Construction

XO/SK (T&G)



Engineered jointing

Corner panels & cavity closers:  
Reduced thermal Bridging

Clear cavity maintained

Lower Lambda value  
for improved U-Values

Robust textured foil



**XTROLINER** SUPERIOR PERFORMANCE  
PIR INSULATION

# Sarking Warm Roof Construction

**XO/SK (T&G)**

**XtroLiner Sarking (T&G)** is an engineered tongue and grooved external roof insulation system with robust facings which meets the passive U-Value of 0.15 W/m<sup>2</sup>K. Using this product improves detailing, speeds up the installation process and provides a uniform plane to detail more effectively.

Creating a warm roof reduces the normal amount of junctions prone to Thermal Bridging, greatly improving the thermal performance of the roof.

**Benefits**

- Robust tongue & groove jointing
- Reduced risk of condensation
- Avoids intrusion into living area
- Excellent U-Value in roofs
- Reduced Thermal Bridging



TONGUE  
& GROOVE  
JOINTING

**Specification Clause**

The pitched roof Sarking insulation shall be XtroLiner XO/SK manufactured to EN 13165 by Unilin Insulation, comprising a rigid modified Polyisocyanurate (PIR) core with textured robust low emissivity foil facings and engineered T&G jointing. The XtroLiner XO/SK \_\_\_ mm with a Lambda value of 0.021 W/mK to achieve a U-Value of \_\_\_ W/m<sup>2</sup>K for the roof element. To be installed in accordance with instructions issued by Unilin Insulation.

An Environmental Product Declaration (EPD), certified by IGBC is available for this product. Please contact technical support for further details.



Refer to NBS clause P10 140, K11 695, K11 55.

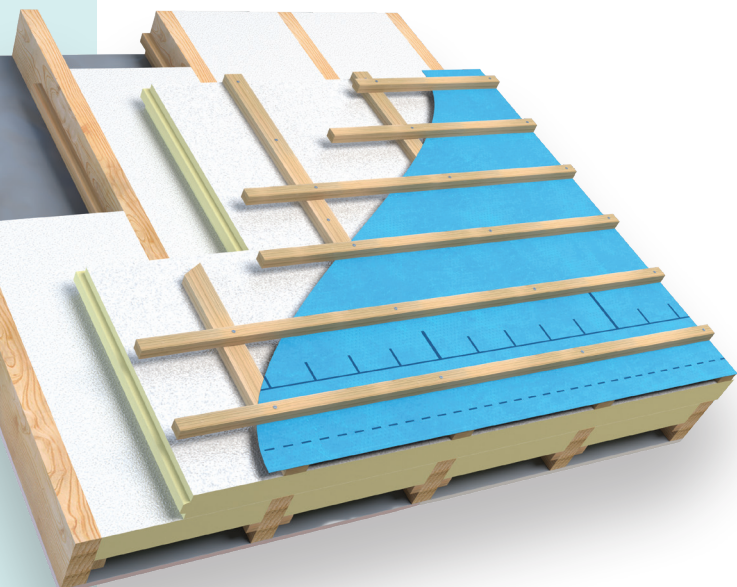
NBS Plus

**Thermal Resistances**

Thickness (mm)	R-Value (m <sup>2</sup> K/W)
50	2.35
75	3.55
100	4.75
125	5.95

**Resistance 'R' Values**

The resistance value of any thickness of Unilin insulation can be ascertained by simply dividing the thickness of the material (in metres) by its lambda value, for example: Lambda 0.021 W/mK and thickness 125mm -> 0.125/ 0.021 -> R-Value = 5.95. In accordance with EN 13165, R-Values should be rounded down to the nearest 0.05 (m<sup>2</sup>K/W).





ROOFS

## XO/SK (T&G)



1. The XtroLiner Sarking tongue and groove jointing offers a practical, on-site solution that results in a more robust continuous layer of insulation, minimising the threat of Thermal Bridging and improving the overall U-Value of the roof.
2. Detailing with breather membranes and vapour control membranes can be more accurately achieved with insulation in a single plane.

### Note

Adding an additional layer of Unilin XO/PR between the counter battens minimises fixing length and improves the overall U-Value of the roof.

## XO/SK (T&G)

Length (mm)	2400
Width (mm)	1200
Thickness (mm)	50, 75, 100, 125

Other thicknesses may be available depending on minimum order quantity and lead time.

## Property & Units

Thermal Conductivity	0.021 (W/mK)
Compressive Strength	>150 (kPa)
Reaction to Fire	Euroclass C-s2, d0

Unilin Declaration of Performance (DoP) for this product is available for download from our website.



# INSTALLATION GUIDELINES

## XO/SK (T&G)

### Warm Roof

1. Ensure cavity wall insulation has continued to roof height to meet with the roof insulation.
2. Fix a treated timber stop rail to the end of the rafter at the eaves.
3. Lay XO/SK over the rafters ensuring the tongued and grooved edges of the boards are fully engaged and positioned in a staggered pattern. Joints should be fully supported by rafters. Fill any gaps with expanding foam. Use large headed clout nails to hold boards temporarily in place until they are secured by the counter battens.



4. Fix 38mm x 50mm counter battens with approved helical type fixings through the XO/SK into the rafter. The amount of fixings is determined by the fixing manufacturer who can also provide wind load calculations.
5. A breathable sarking membrane should be fitted; refer to manufacturer's Agrément certification. Ventilation may have to be provided subject to that certification and minimises the risk of interstitial condensation forming on the underside of the membrane. Providing an unventilated void under the membrane can improve the thermal performance.
6. Secure 50mm x 25mm tiling battens through the counterbatten and XO/SK to the rafter.

7. If an additional layer of insulation is required, Xtroliner Pitched Roof can be fixed between the rafters.



8. Cut XO/PR with fine toothed saw to fit tightly between rafters, flush with the top of the rafter. Allow slight oversize of cut to achieve 'friction fit' and seal any gaps with expanding foam.
9. Provide a separate vapour control layer to the warm side of the insulation.
10. Finish with plasterboard fixed with drylining screws. Screw fix every 150mm, 12mm from edge of boards, ensuring a minimum 25mm penetration into the rafter or alternatively follow plasterboard manufacturer installations guidance.

# THERMAL PERFORMANCE

## XO/SK (T&G)

### Typical U-Values



**Table 1**

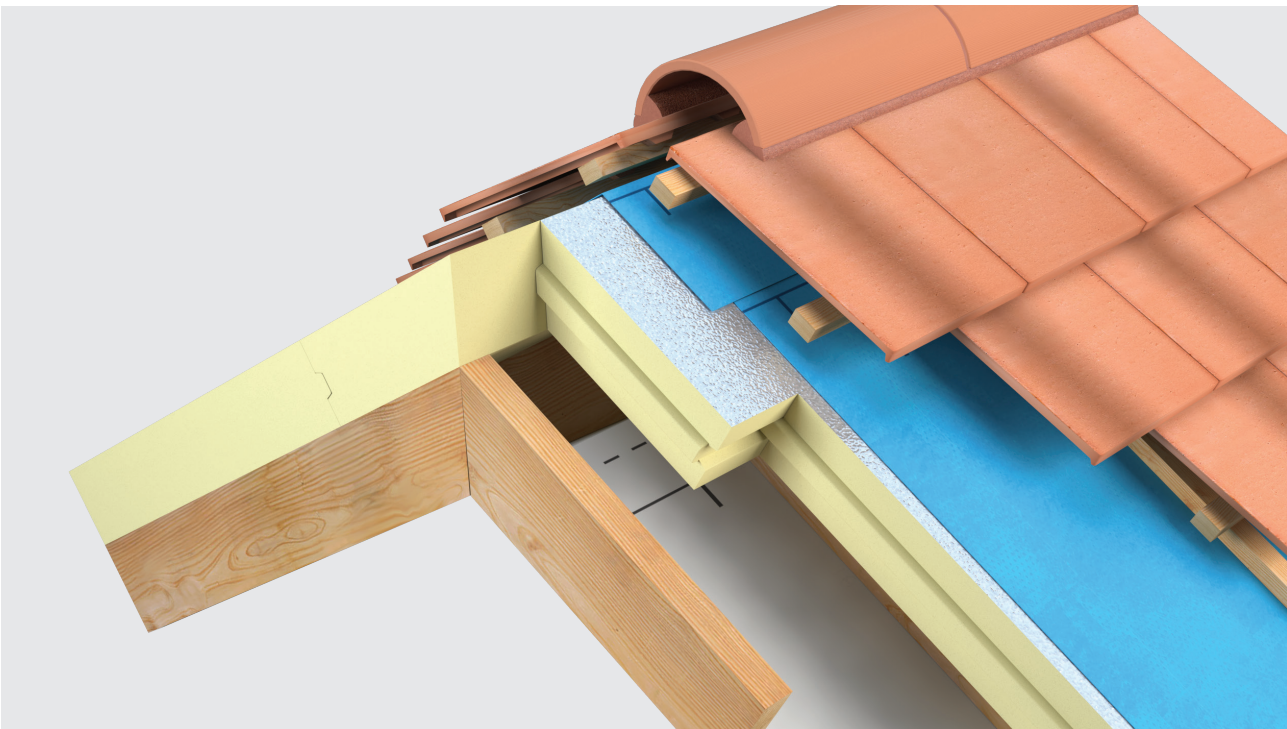
U-Value calculations to EN ISO:6946

**XO/SK (T&G)** Insulation for Sarking Warm Roof Construction

**Warm Roof build up:**

- Tiles
- Battens
- Breathable membrane
- XO/SK over rafters
- XO/PR between rafters
- Air layer between rafters
- Vapour control layer
- Plasterboard
- Plaster skim

Over	Between	600mm	400mm
100mm	50mm	0.14	0.14
75mm	75mm	0.14	0.15
100mm	-	0.18	0.18
125mm	-	0.15	0.15
100mm	100mm	0.12	0.12



# GOOD PRACTICE GUIDE

## XO/SK (T&G)

### Fabric Energy Performance

The difference is in the detail

**Fabric Energy Efficiency is based on 3 main principles:**

1. U-Values
2. Thermal Bridging
3. Air tightness

### What is Thermal Bridging?

Thermal Bridging occurs in small areas where the insulation level is reduced significantly, compared with the remainder of the element. They may be 'Repeating,' 'Random,' or 'Non-Repeating.'

### How is Thermal Bridging measured?

Thermal bridges are calculated as a linear thermal transmittance value - PSI ( $\Psi$ ) measured in W/mK. SAP is the software programme used to calculate a dwelling's energy rating. Within this software, Thermal Bridging through junctions is accounted for as a 'Y-Value.'

## Thermal Bridging & Airtightness

A comparison between the Y-Value and a hole in the construction



**Y= 0.20**

The equivalent of an open 'Garage Door' 2.1m x 3.3m (6.93m<sup>2</sup>) opening.



**Y= 0.08**

The equivalent of an open 'Patio Door' 2.1m x 1.8m (3.78m<sup>2</sup>) opening.



**Y= 0.03**

The equivalent of an open 'Window' 1.25m x 1.25m (1.56m<sup>2</sup>) opening

Our innovative range of insulation products deliver the U-Value requirements to meet Passive standards and building regulations, but it's not just about U-Values any longer.

How the system builds, how it interconnects at junctions and how it is witnessed and confirmed on site is equally as important.

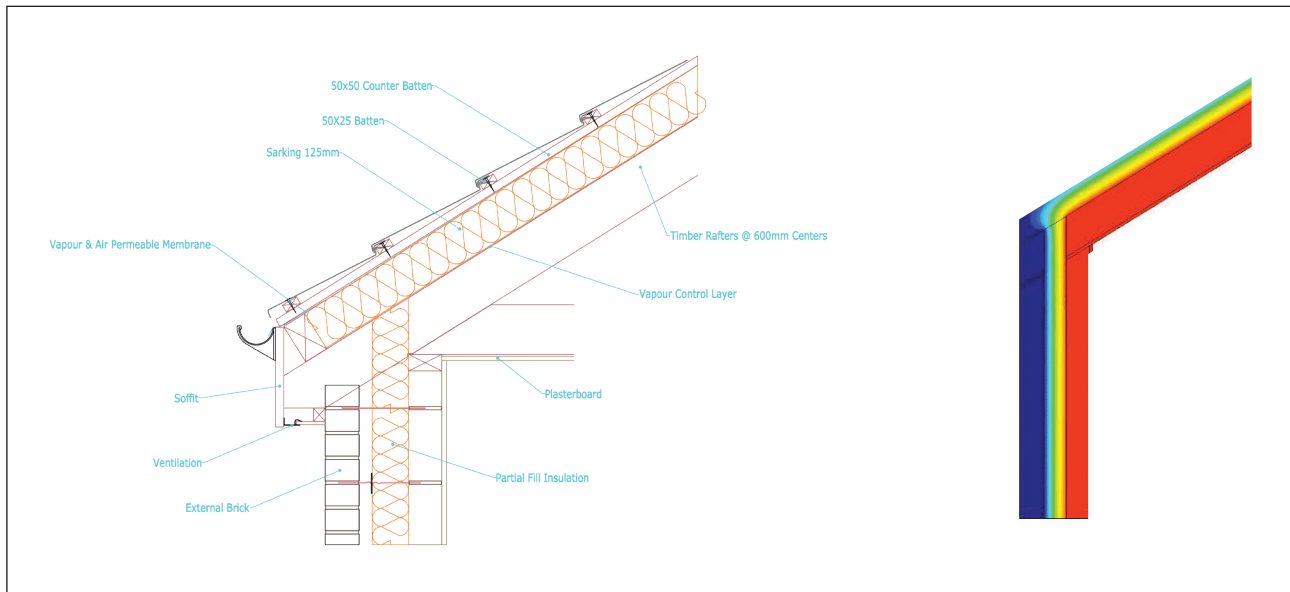
### Good detailing delivers benefits:

- + More energy efficient building with lower running costs.
- + Less chance of condensation and mould forming at poorly detailed junctions.
- + A more cost effective method of achieving a low energy building.

# THERMAL BRIDGING

## XO/SK (T&G)

To achieve good detailing, Accredited Construction Details (ACDs) should be followed during the planning, design and build process.



For further information on this topic: Unilin has published Thermal Bridging guidance, request your copy from our technical department. Further certificates are also available for download from our website.

Unilin has an extensive library of downloads available on our website. These include the ACDs, BIM files, CAD drawings and Agrément certificates. Unilin also offers CPD training on Thermal Bridging as well as a wide variety of building regulation topics.

Visit [unilininsulation.co.uk](http://unilininsulation.co.uk)





## HANDLING, CUTTING & STORAGE

Unilin insulation should be stored off the ground, on a clean, flat surface and must be stored under cover. The polythene wrapping is not considered adequate protection for outside exposure. Care should be taken to protect the insulation in storage and during the build process.

The insulation boards can be readily cut using a sharp knife or fine toothed saw. Ensure tight fitting of the insulation boards to achieve continuity of insulation as asked for within the ACDs. Appropriate PPE should be worn when handling insulation. Please refer to Health & Safety data sheets on our website.

The boards are wrapped in polythene packs and each pack is labelled with details of grade/type, size and number of pieces per pack.

### **Durability**

Unilin Insulation products are stable, rot proof, provide no food value to vermin and will remain effective for the lifetime of the building, depending on specification and installation. Care should be taken to avoid contact with acids, petrol, alkalis and mineral oil. When contact is made, clean materials in a safe manner before installation.







# Expect more Knowledge

Unilin Insulation, formerly Xtratherm, is one of the UK's largest manufacturers and suppliers of insulation. We have a 20-plus year history of working in partnership with construction professionals to close the gap between design and as-built performance.

Higher standards of fabric performance call for greater adherence to best practice detailing. To achieve this and to 'close the gap' between design and build, we provide a dedicated Technical Team, all qualified to the highest standards of competency in U-Value calculation and condensation risk analysis.

## Here to support you

- BRE listed Thermal Bridging Detailing
- BRE Trained Modelling
- BBA/TIMSA calculation competent
- Warranted Calculations available
- Immediate technical response
- SAP Qualified
- Insulation systems to deliver real onsite performance

## Get in touch

T: +44 (0) 371 222 1055 E: [info.ui@unilin.com](mailto:info.ui@unilin.com) [unilininsulation.co.uk](http://unilininsulation.co.uk)

**FREE**  
One-to-one  
advice



**Unilin Insulation UK Ltd**

Park Road, Holmewood  
Chesterfield, Derbyshire  
United Kingdom  
S42 5UY

t. +44 (0) 371 222 1033

e. [info.ui@unilin.com](mailto:info.ui@unilin.com)

[unilininsulation.co.uk](http://unilininsulation.co.uk)

**The Sustainable Solution**

Specifying Unilin Insulation is a real commitment to minimising energy consumption, harmful CO<sub>2</sub> emissions and their impact on the environment. Using our products is one of the most effective ways to reduce energy consumption – in fact, after just eight months the energy they save far outweighs the energy used in their production. In addition, our manufacturing facilities operate to an ISO 14001 certified Environmental Management System.

**Environmental Product Declaration (EPD)**

An Environmental Product Declaration or EPD for a construction product indicates a transparent, robust and credible step in the pursuit and achievement of real sustainability in practice, it is a public declaration of the environmental impacts associated with specified life cycle stages of that product. Unilin EPDs have been independently verified in accordance with EN 15804+A2:2019 and ISO 14025 accounting for stages of the LCA from A1 to A3, with options A4-A5 and modules C1-C4 and D included. The process of creating an EPD allows us to improve performance and reduce resource wastage through improvements in product design and manufacturing efficiency. They play a crucial role in manufacturing and construction and are increasingly asked for by industry.

**EPDs and BREEAM**

BREEAM is primarily trying to encourage designers to take EPDs into consideration when specifying products. BREEAM requires EPDs to be verified by a third-party. For the Mat 02 category, points are awarded based on whether EPDs are generic, manufacturer-specific, or product-specific. Non 3rd party verified EPDs to EN 15804 cannot be accepted. All of Unilin EPDs are externally verified.

**Responsible Sourcing**

Unilin has BES 6001 certification for responsible sourcing. The second BREEAM credit under that category is based on responsibly-sourced materials – at least 80% of the total insulation used in roofs, walls, ground floors and services must meet any of tier levels 1 to 6 in the BREEAM table of certification schemes. Our Environmental Management System is certified under EN ISO 14001, and our raw materials come from companies with similarly certified EMS (copies of all certificates are available for BREEAM assessments). This level of responsible sourcing meets tier level 6 in the BREEAM table.

Good workmanship and appropriate site procedures are necessary to achieve expected thermal and airtightness performance. Installation should be undertaken by professional tradespersons. The example calculations are indicative only, for specific U-Value calculations contact Unilin Insulation Technical Support. Unilin technical literature, Agrément certifications and Declarations of Performance are available for download on the Unilin Insulation website. The information contained in this publication is, to the best of our knowledge, true and accurate at the time of publication but any recommendations or suggestions which may be made are without guarantee since the conditions of use are beyond our control. Updated resources may be available on our websites. All images and content within this publication remain the property of Unilin Insulation.



**ISO 45001** Occupational Health & Safety Management Systems

**ISO 9001** Quality Management Systems

**ISO 14001** Environmental Management Systems