

# INSTALLATION INSTRUCTIONS

## UTHERM Flat Roof

### PRINCIPLE

UTHERM Flat Roof is an insulation system, which provides high thermal performance for flat roofs. Depending on the roofing type, a different type of product will be selected within the UATHERM range. In this regard, the tapered boards include an integrated slope.

#### 1. PRODUCT RANGE OVERVIEW

- **UTHERM Flat Roof BG**  
= A PUR insulation board, with a facing on both sides that consists of bituminous glass tissue finished with PP spun fleece.
- **UTHERM Flat Roof PIR L**  
= A PIR insulation board, with a facing on both sides that consists of a gastight aluminium composite foil facing.
- **UTHERM Flat Roof PIR M**  
= A PIR insulation board, with a facing on both sides that consists of mineralised glass tissue.
- **UTHERM Flat Roof PIR BGM**  
= A PIR insulation board, where the facing on one side consists of bituminous glass tissue finished with PP spun fleece, while the other side consists of a facing of mineralised glass tissue.

#### 2. ADVANTAGES OF THE SYSTEM



High thermal performance



Easy to handle



Standard thicknesses



Pressure-resistant



Low thicknesses



Slope of up to 2%

The UATHERM Flat Roof insulation method offers the advantage of a quick and efficient insulation of flat roofs, which is harmonised with the roofing that has been selected. Standardised thicknesses and dimensions can be delivered with this insulation system, which promotes an easy installation. In this regard, the easy processing of the elements leads to little waste.

#### 3. APPLICABILITY

The UATHERM Flat Roof insulation system is suitable for insulating roofs that are made of concrete and wood, or those that are constructed with a steeldeck as a structural support.

## REALISATION

### 1. INTRODUCTION

During of the application of flat roof insulation boards, one must take into account the following:

- The installation process must prevent the enclosure of moisture, both during and after the application of the insulation layer. Process the boards in a dry condition and store them in a dry place!
- Loose dirt must be removed before installation. The installation surface must be clean, dry and flat.
- The insulation boards must be handled with care. Damaged boards may not be installed.
- The insulation boards must be installed firmly against each other and must be placed in a staggered composition.
- The boards must fit tightly at the at protruding edges.
- For PIR L insulation boards, the board side marked "Upper Side" must be installed upwards.
- Infill pieces which are smaller than 300 mm may only be used in the middle area of the roof surface.
- It must be ensured that the roofing system cannot be perforated by sharp items and/or concentrated loads.
- If the insulation boards are installed on a non-load bearing subsurface, such as steeldeck structures, then the ratio of the thickness of the insulation plate and the upper width must be a minimum of 1:3.
- Boards with a minimum thickness of 50 mm do not have to terminate on a load-bearing surface, if the overhang of the board is smaller or equal to 110 mm.
- Differences in height between connecting board edges may not amount to more than 3 mm.

### 2. INSTALLATION OF A VAPOUR-RESISTANT LAYER

The necessity for a vapour-resistant layer must be determined on the basis of a building physics calculation. The result is dependent on the climate class of the building, the type of substructure and the insulation.

Vapour barrier quality:

| Class ( $\mu\text{d}$ )      | MATERIAL   |
|------------------------------|--|
| E1<br>$\geq 2$ to $< 5$ m    | PE foil (thickness 0.2 mm) with overlaps of at least 100 mm  |
| E2<br>$\geq 5$ to $< 25$ m   | PE foil (thickness $> 0.2$ mm) and aluminium laminates with sealed seams<br>Bituminous glass fleece V50/16<br>Bituminous polyester fleece P 150/16 |
| E3<br>$\geq 25$ to $< 200$ m | Reinforced bitumen V3, V4, P3 or P4<br>Polymer bitumen APP or SBS (minimum thickness = 3 mm), glass fleece or reinforced PES                       |
| E4<br>$\geq 200$             | Reinforced bitumen with metal foils (ALU3)<br>Multiple-layer vapour barriers made of polymer bitumen ( $> 8$ mm)                                   |

The choice of a vapour barrier is dependent on the subsurface and the climate class.

In case of renovations of vapour-resistant roofing, the insulation board can be installed directly on the old roofing, after which new roofing can be immediately applied. The installation of an additional vapour barrier is not always required here. This has to be verified by means of a calculation.

In such cases, it is very important to thoroughly check the quality of the old roofing, checking it for possible deficiencies. If deficiencies are detected, then the old roofing cannot be taken into account and an additional vapour barrier always has to be installed.

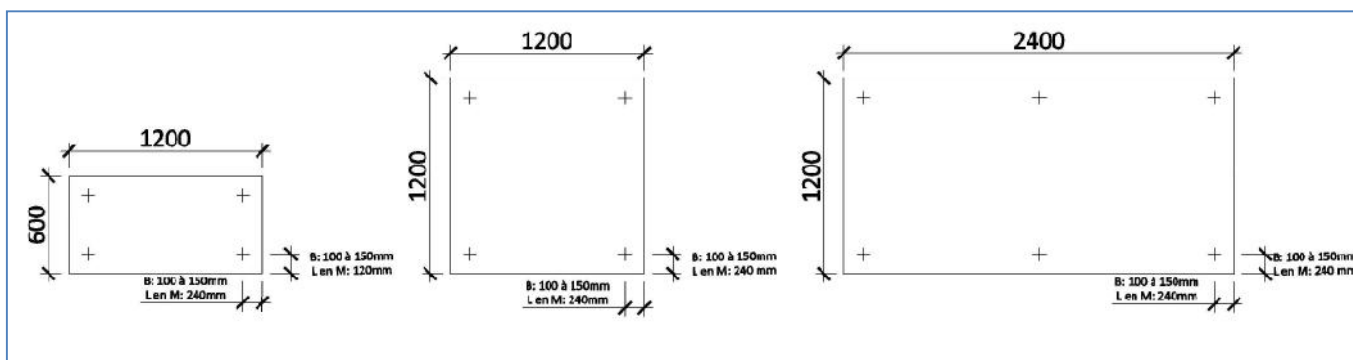
### 3. ATTACHMENT TECHNIQUES

#### 1. Mechanical attachment

**UTHERM Flat Roof** insulation boards can be attached mechanically.

The following preconditions have to be observed in the application of fastening elements.

- The fastener must be positioned vertically.
- A mechanical attachment is always carried out in combination with a washer.
- The head of the fastener must lie at least below the level of the washer.
- Washers may not be visibly deformed.
- Washers may not have penetrated the insulation material for more than 3 mm, and the laminating layer may not show any visible damages.
- The washers may not be attached loosely.



For all zones on the roof surface, the effectively required number of fasteners must be determined in function of the wind load, and in conformity with the regulations of the manufacturer of the roof waterproofing.

Additional comments:

- When using screws, the rotational speed of the screwdriver must conform to the guidelines provided by the supplier of the fasteners.
- It must be possible to set the depth of the stroke of the attachment tool.

#### 2. Cold glueing

Cold glueing is carried out over the full surface, or the glue is applied in even strips on the underground. Dependent on the wind load, more or less glue will have to be applied.

At the edges and at the corner areas of the roof, and in case of strongly exposed roofs, a larger surface of a glue must be applied, or the insulation boards must be secured mechanically in addition or be provided with ballast.

The manufacturer of the glue must provide information on the suitability of his product.

The application of the glue must always be carried out according to the regulations of the manufacturer.

Double-layer glueing of the insulation boards is possible.

UNILIN recommends that a maximum size of 1200 mm x 1200 mm is used, if the insulation boards are to be attached with glue.

#### 3. Glueing with synthetic glue

For 1-component glue, it must be possible to foam up the glue, which is stimulated amongst others by the air humidity and ambient temperature. The installation usually takes place by glueing sections (strip-by-strip) according to the instructions of the glue manufacturer. The use of synthetic glues leads to rigid or elastic connections, which prevents "walking" of the insulation boards.

The manufacturer of the glue must provide information on the suitability of his product.

UNILIN recommends that a maximum size of 1200 mm x 1200 mm is used, if the insulation boards are to be attached with glue.

#### 4. Hot glueing

For reasons of technical compatibility, only insulation boards with a bituminous glass fleece facing can be used for hot glueing.

UNILIN recommends that a maximum size of 1200 mm x 1200 mm is used, if the insulation boards are to be attached with glue.

**UTHERM Flat Roof BG** roof insulation boards are resistant to temperatures of up to 250°C, which means they can be attached to the subsurface with hot bitumen over the entire surface.

In case of partial glueing, every insulation board must be solidly glued for at least 50% to the subsurface.

Glueing according to a distribution of the glue in a serpentine pattern is reliable. Glue spot attachment is not recommended in this case.

The quantity of hot bitumen glue is dependent on the subsurface and usually amounts to an average of 1.5 kg/m<sup>2</sup>. The processing temperature lies at 180°C.

With this processing technique, the **UTHERM Flat Roof BG** roof insulation boards are always installed in a crisscross pattern and in a single layer. 2-layer processing is not possible, due to the high temperatures.

#### 5. Loose installation

The **UTHERM Flat Roof PIR M/BG/L/BGM** insulation boards can only be applied without fasteners if the roofing and the necessary load are installed immediately after the boards, and if the roofing can be sufficiently fixed to the edges of the roof. This also applies when terrace tiles provide the necessary ballast load.

#### 4. OVERVIEW OF APPLICABLE ATTACHMENT TECHNIQUES FOR UThERM ROOF INSULATION BOARDS, DEPENDING ON THE TYPE OF SUBSURFACE

|          | Mechanical attachment | Cold glueing      | Glueing with synthetic glue | Hot glueing         | Loose (ballasted)   |
|----------|-----------------------|-------------------|-----------------------------|---------------------|---------------------|
| Wood     | L<br>M<br>BG<br>BGM   | M<br>BGM (M side) | L<br>M<br>BGM (M side)      | BG<br>BGM (BG side) | L<br>M<br>BG<br>BGM |
| Concrete | L<br>M<br>BG<br>BGM   | M<br>BGM (M side) | L<br>M<br>BGM (M side)      | BG<br>BGM (BG side) | L<br>M<br>BG<br>BGM |
| Steel    | L<br>M<br>BG<br>BGM   | M<br>BGM (M side) | L<br>M<br>BGM (M side)      | BG<br>BGM (BG side) | L<br>M<br>BG<br>BGM |

#### 5. APPLICATION OF A ROOF SEALANT

| Type of roof sealant          | Fastening method  | APPLICATION SURFACE   |   |   |
|-------------------------------|---|---|---|---|
|                               |   | Concrete  | Steel   | Wood  |
| Bituminous roof sealant layer | Partial glueing according to the pouring method for hot bitumen | BG<br>BGM (BG side)   | BG<br>BGM (BG side)   | BG<br>BGM (BG side)   |
| Bituminous roof sealant layer | Partial glueing according to the torch-applying method          | BG<br>BGM (BG side)<br>M <sup>1</sup> -L <sup>1</sup>       | BG<br>BGM (BG side)<br>M <sup>1</sup> -L <sup>1</sup>       | BG<br>BGM (BG side)<br>M <sup>1</sup> -L <sup>1</sup>       |
| Bituminous roof sealant layer | Full-surface glueing with cold glue                             | BGM (M side)<br>M   | BGM (M side)<br>M   | BGM (M side)<br>M   |
| Bituminous roof sealant layer | Self-glueing  | BGM (M-side) <sup>2</sup><br>M <sup>2</sup> -L <sup>3</sup> | BGM (M-side) <sup>2</sup><br>M <sup>2</sup> -L <sup>3</sup> | BGM (M-side) <sup>2</sup><br>M <sup>2</sup> -L <sup>3</sup> |
| EPDM                          | Full-surface glueing with cold glue or synthetic glue           | B-L-M   | B-L-M   | B-L-M   |
| PVC                           | Full-surface glueing with synthetic glue                        | L-M   | L-M   | L-M   |
| Sealing layer                 | Loosely installed with a ballast layer                          | B <sup>4</sup> -L-M   | B <sup>4</sup> -L-M   | B <sup>4</sup> -L-M   |
| Sealing layer                 | Mechanically attached   | B <sup>4</sup> -L-M   | B <sup>4</sup> -L-M   | B <sup>4</sup> -L-M   |

<sup>1</sup> 2-layer bituminised roofing. Top layer torched-on.

<sup>2</sup> The manufacturer of the self-glueing membrane must provide information on the suitability of his product.

<sup>3</sup> Solution is dependent on the used roofing system. Contact Unilin for more information.

<sup>4</sup> If a PVC sealing layer is used, then a separating layer must be applied according to the regulations of the manufacturer.

## 6. TAPERED INSULATION

With a flat roof, tapered insulation ensures that an incline is created, on which rainwater can flow off to a drainage point. This slope is achieved by installing the insulation boards, which have an integrated incline, in a certain sequence that has been determined in advance. This method can be used if the underlying structure of the flat roof does not have a slope.

On request, Unilin can prepare an installation plan for the tapered insulation of the flat roof, which is based on a few parameters. See the checklist at the end of this document.

Slope incline:           Inclines are possible from 0.83% to 2.08%. (PIR L)  
                               Inclines are possible from 1.25% to 1.67%. (PIR BG)

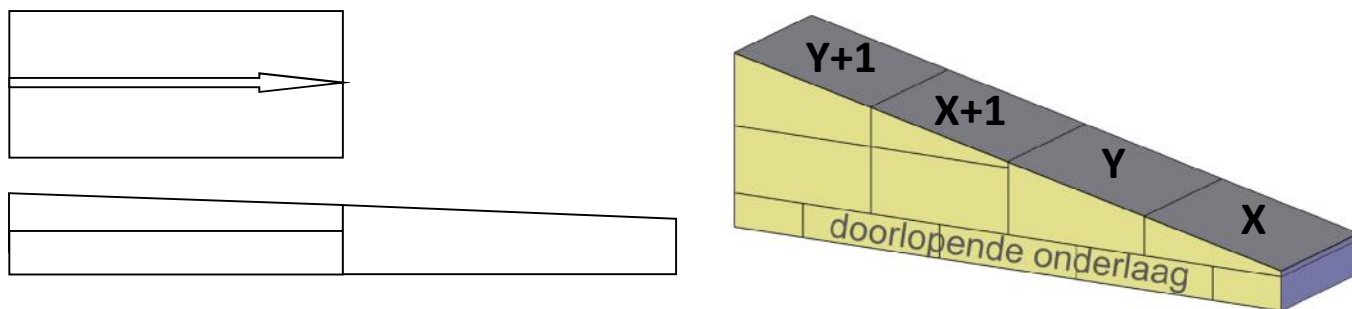
**ONE-SIDED SLOPE:** Rainwater drainage to one side only

- **Single-layer**



The single-layer insulation boards are indicated on the installation plans with a sequential letter (here indicated as 'x').

- **Multiple-layer**

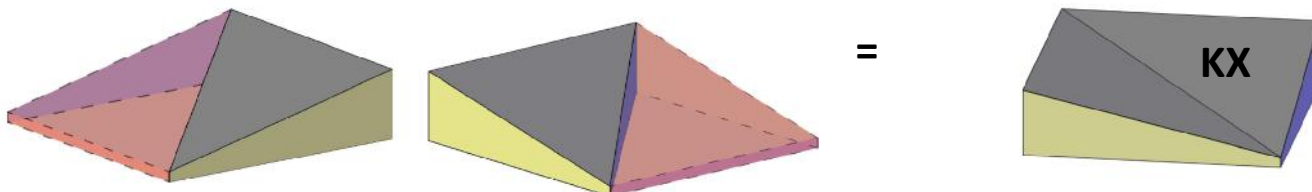


The legend for the installation plans of tapered insulation:

- The insulation boards are given a sequential letter by thickness.
- The multiple-layer insulation boards are indicated on the installation plan with a sequential letter, which is followed by '+ 1' (for instance 'x + 1').
- A continuous sublayer can be installed underneath the tapered boards, so as to obtain a minimal thickness. This sublayer is called a 'Vollflächige Unterlegung' (full-surface support) in the following overview table.
- Boards that adjoin flatly to the tapered boards are indicated by the letter 'N' and are followed by a sequential number.

**MANY-SIDED SLOPE:** rainwater drainage to a single point

- **V-gutter**

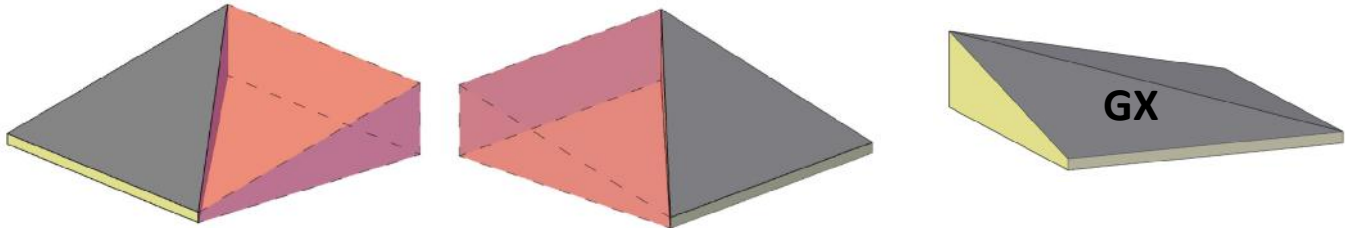


Only possible with a 45° drainage slope.

Board waste can then only be reused in combination with the inner or the outer corner.

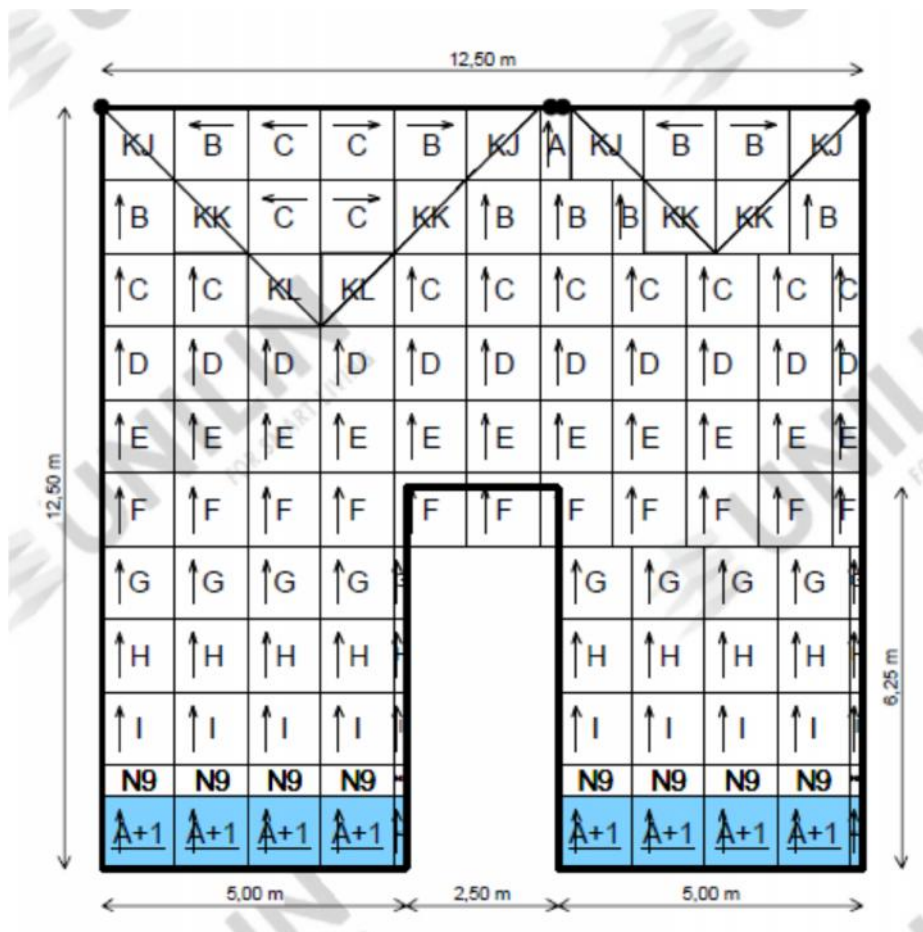
The insulation boards in the form of a V-gutter are indicated on the installation plan by a sequential letter, which is preceded by a 'K'.

- **Ridge cap**



The insulation boards in the form of a ridge are indicated on the installation plan by a sequential letter, which is preceded by a 'G'.

- **Example of the planned slope of a flat roof**



|   |  |  |
|---|--|--|
| <b>UNILIN bvba</b><br>division insulation<br><br>Waregemstraat 112<br>8792 Desselgem<br>Belgium<br><b>T</b> +32 56 73 50 91<br><b>F</b> +32 56 73 50 90<br>info.insulation@unilin.com<br>www.unilin.com | Date:<br><br>Project:<br><br>Site address: | Dealer:<br><br>Contact:<br><br>Contractor:<br><br>Architect: |
|---|--|--|

- Plans (preferably in .pdf, .dwg or .dxf format):
  - Roof plan with indication of drainage directions and gullies
  - Sections
- Type of roof covering (membrane):
  - Roofing: Manufacturer & product name: .....
  - EPDM: Manufacturer & product name: .....
  - PVC: Manufacturer & product name: .....
  - TPO: Manufacturer & product name: .....
  - Other: Manufacturer & product name: .....
- Type of Utherm:
  - Roof B:
    - Fall 10mm/1.2m (0.83%)
    - Fall 15mm/1.2m (1.25%)
  - Roof L:
    - Fall 10mm/1.2m (0.83%)
    - Fall 15mm/1.2m (1.25%)
    - Fall 20mm/1.2m (1.67%)
    - Fall 25mm/1.2m (2.08%)
  - Roof M (projects above 1000m<sup>2</sup> - delivery date to be determined with Unilin):
    - Fall 10mm/1.2m (0.83%)
    - Fall 15mm/1.2m (1.25%)
- Drainage type:
  - Single (to gutter)
  - Double (diagonally to gully)
- Insulation thickness:
 

|                    |                                   |
|--------------------|-----------------------------------|
| ○ Minimum: .....mm | U value: ..... W/m <sup>2</sup> K |
| ○ Maximum: .....mm | U value: ..... W/m <sup>2</sup> K |
| ○ Average: .....mm | U value: ..... W/m <sup>2</sup> K |
- Remarks or specific details to take into account:
 

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