

A large, stylized number "104" in white, set against a teal background that tapers to the right. The number has a slight 3D effect with a shadow.

FIBRAN_{xps} INCLINE

Installation instructions

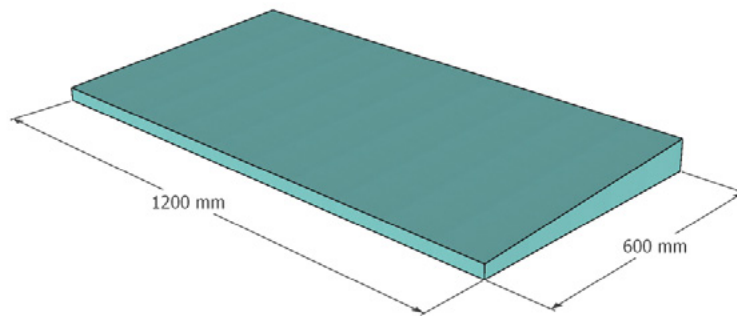
Thermal insulation boards for inclinations
on flat surfaces

FIBRANxps INCLINE

Thermal insulation boards for inclinations on flat surfaces

1. Product description

Made of extruded polystyrene, FIBRANxps INCLINE boards with a sloped surface are used to create inclination planes for effective drainage of any flat surfaces – flat roofs, parking lots, terraces, balconies, loggias and other. Instead of the more demanding construction of ordinary inclination assemblies, inclined planes are easily created with FIBRANxps INCLINE boards. In addition, FIBRANxps INCLINE boards also act as a thermal insulation layer and reduce the load and height of an otherwise heavy and thick inclination assembly.



Picture 1: Diagram of a FIBRANxps INCLINE board

2. Advantages of FIBRANxps INCLINE

Advantages of FIBRANxps INCLINE thermal insulation boards:

- easily adaptable,
- exact inclination,
- thermally effective,
- known for high compressive strength,
- made of durable material.

2.1. Technical Characteristics

The main technical characteristics of FIBRANxps INCLINE thermal insulation boards are shown below:

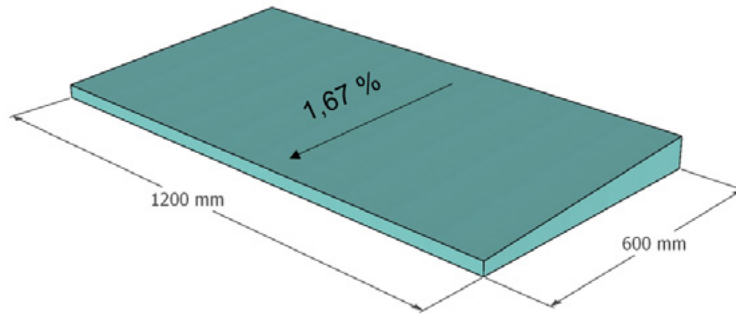
Board dimensions (length x width)	1200 x 600 mm
Inclination in %	standard: 1,67 % and 2,00 %; available on request: 0,67 %, 0,84 %, 1,00 %, 1,34 %, 2,34 %, 2,67 % and 3,00 %.
Edge profile	Straight edges ("I" profile)
Boards in package	6
Coverage of package	4,32 m ²
Application temperature	-50 °C to +75 °C
Thermal conductivity (λ_p)	0,035 W/mK
Compressive strength	300 kPa (500 kPa and 700 kPa are available on request)

Table 1: Technical characteristics of FIBRANxps INCLINE

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2.2. Types and dimensions of standard inclination boards



Picture 2: Diagram of a FIBRANxps INCLINE board and the direction of inclination

A flat roof inclination plane is constructed with different types of FIBRANxps INCLINE boards. The types and dimensions used in creating inclined planes are shown in Tables 2 and 3 below:

Types of FIBRANxps INCLINE boards	Inclination [%]	Thickness [mm]
Type 0*	1,67	10 – 20
TYPE A	1,67	20 – 30
TYPE B	1,67	30 – 40
TYPE C	1,67	40 – 50
TYPE D	1,67	50 – 60
TYPE E	1,67	70 - 80

Table 2: Types of FIBRANxps INCLINE boards with a 1,67% inclination

* Available on request, Type 0 is only used for lowest thickness at the drain.

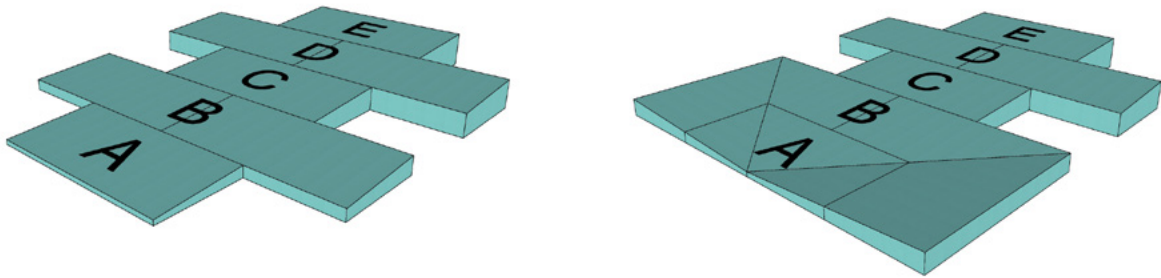
Types of FIBRANxps INCLINE boards	Inclination [%]	Thickness [mm]
Type 0*	2,00	10 – 20
TYPE A	2,00	20 – 32
TYPE B	2,00	32 – 44
TYPE C	2,00	44 – 56
TYPE D	2,00	56 – 68
TYPE E	2,00	68 – 80

Table 3: Types of FIBRANxps INCLINE boards with a 2,00 % inclination

* Available on request, Type 0 is only used for lowest thickness at the drain.

3. Instructions for installing FIBRANxps INCLINE boards

FIBRANxps INCLINE boards are laid according to a prepared installation plan, taking into account individual surface area, drain positions and direction of drainage as well as any height limitations. The installation plan, number and types of boards used and other parameters differ depending on the inclination design (e.g. one-sided inclination plane for linear drainage or multidirectional inclination planes for point drainage). As a rule, five standard types of FIBRANxps INCLINE boards are used, ranging from A to E. Alternatively, if board Type 0 is used, the installation procedure is slightly adjusted.



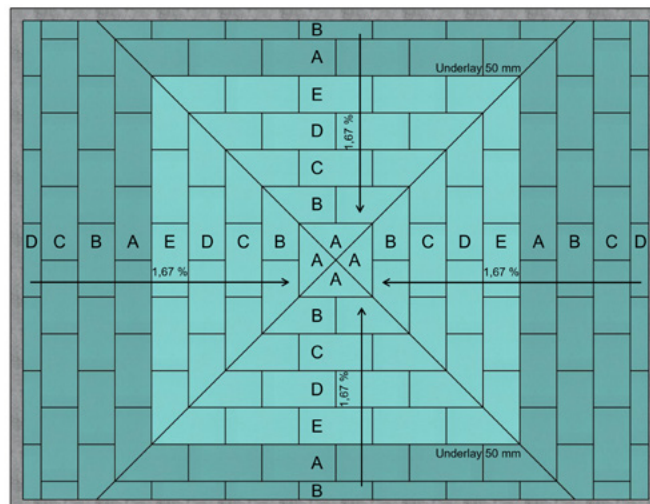
Picture 3: Installation concept for linear drainage (left) and point drainage (right)

3.1. Point drainage

Installation starts at the drain positions – these will become the low-points of the roof. With multiple drains, the boards should be laid in a succession of equal board types at every drain. Before installation of the FIBRANxps INCLINE boards, roof valleys must be determined depending on drain positions.

3.1.1. Centrally positioned drain

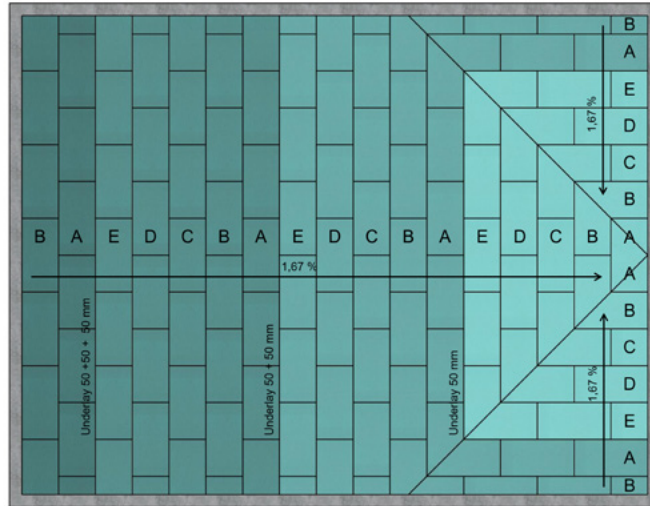
When opting for a centrally positioned drain, the FIBRANxps INCLINE boards must be laid with four roof valleys perpendicular to each other. As shown in Picture 3, the roof area is divided into four contributing areas and the rainwater is drained from four directions toward the centrally positioned drain.



Picture 4: Centrally positioned drain

3.1.2. Drain at the roof parapet wall

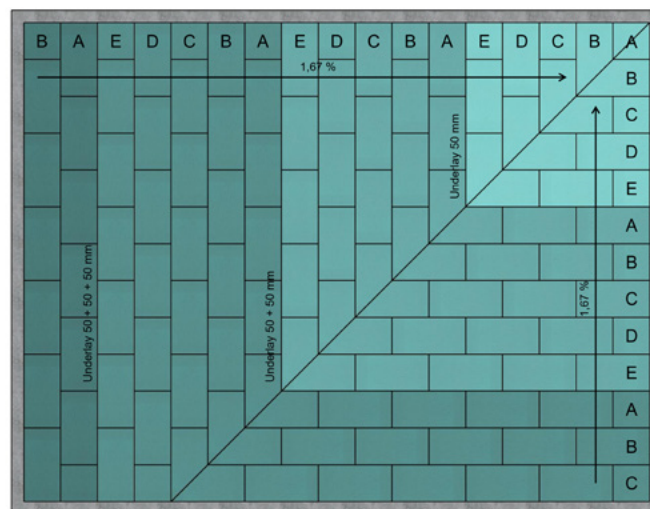
With the drain positioned at the roof parapet wall, the inclination thermal insulation has two roof valleys perpendicular to each. Picture 5 shows that the roof is divided into three contributing areas with rainwater flowing towards the drain from three different directions.



Picture 5: Drain at the roof parapet wall

3.1.3. Drain in the corner of roof parapet walls

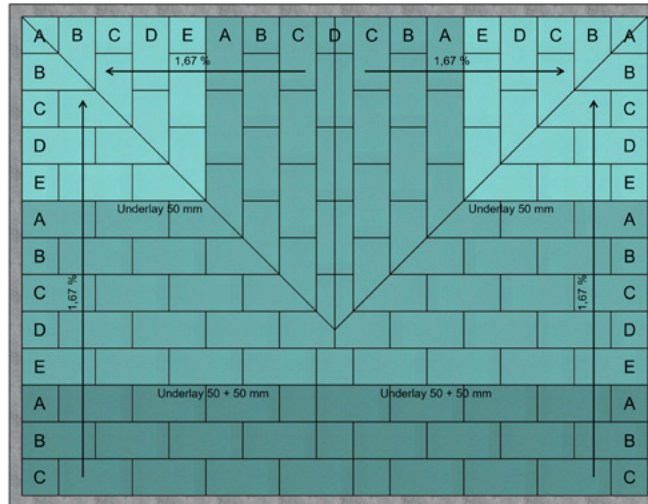
Only one roof valley at a 45 degree angle to the building's side wall is formed if the drain is positioned in the corner of two roof parapet walls. Picture 6 shows that the roof surface is divided into two contributing areas with rainwater flowing into the drain from two different directions.



Picture 6: Drain in the corner of two roof parapet walls

3.1.4. A combination of multiple drains

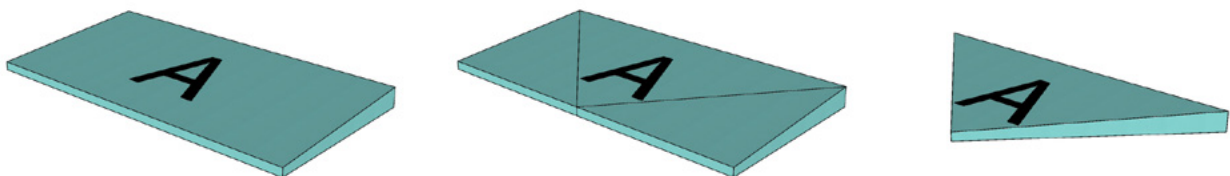
Often, roof surfaces have more than one drain, as shown in Picture 7. Also, several types of point drainage (see 3.1.1., 3.1.2. in 3.1.3. above) can be found on a building. This calls for a careful design of roof valleys as they serve different contributing roof areas. The installation of inclination boards is more demanding as the different inclination planes must meet at exactly the same height levels.



Picture 7: Two drains at the corners of roof parapet walls

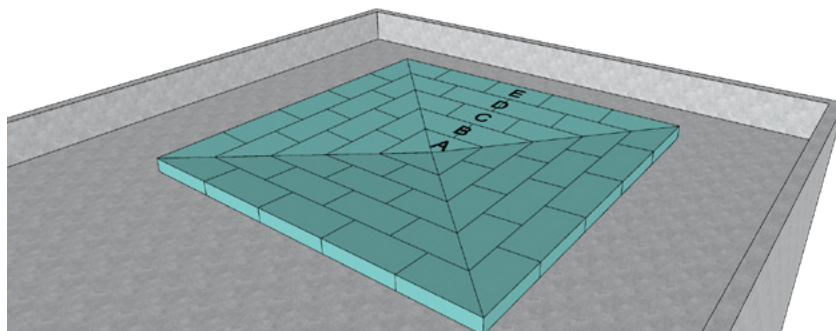
3.1.5. Laying principles with a centrally positioned drain

The type A boards are positioned at the drain and cut as shown in Picture 8 to create a double roof valley which will direct rainwater towards the drain.



Picture 8: Cutting the type A boards for a centrally positioned drain

In all next phases, boards of types B, C, D and E are cut in the same manner. Along their junction lines, four roof valleys are formed as shown in Picture 9:

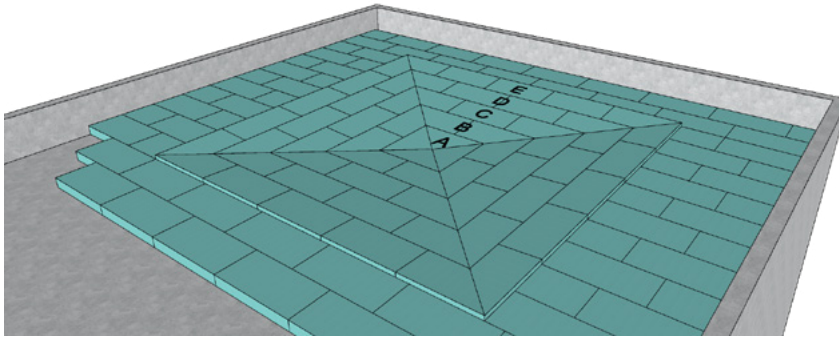


Picture 9: Continuing the installation with board types B through E

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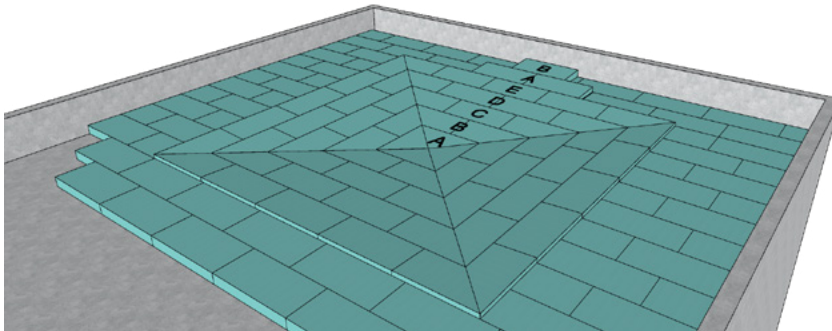
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Once the first sequence of FIBRANxps INCLINE boards typed A through E is laid, the remaining roof area is laid with an underlaying layer of FIBRANxps 300-I boards. As shown in Picture 10, 50 or 60 mm thick boards are used for a 1,67 % or 2 % inclination plane, respectively.



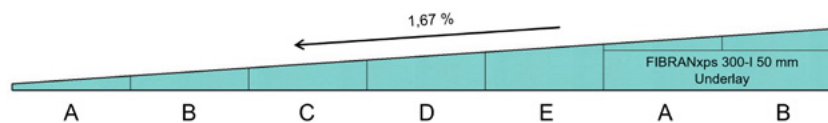
Picture 10: Completing the underlay before the next sequence of Type A through E boards are laid

Once the underlay is completed, we continue with alternating layers of FIBRANxps INCLINE boards sequenced A through E. This is shown in Picture 11.



Picture 11: Boards typed A to E to are laid until the inclination plane is completed

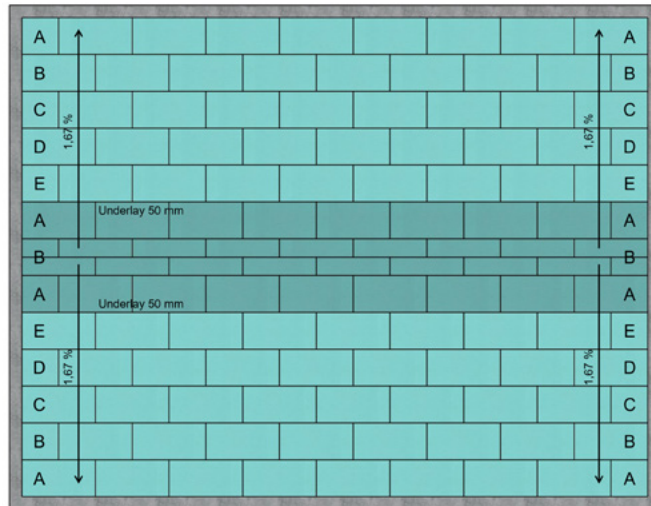
A section of the boards sequence of the above inclination plane is shown in Picture 12.



Picture 12: Section of the inclination plane

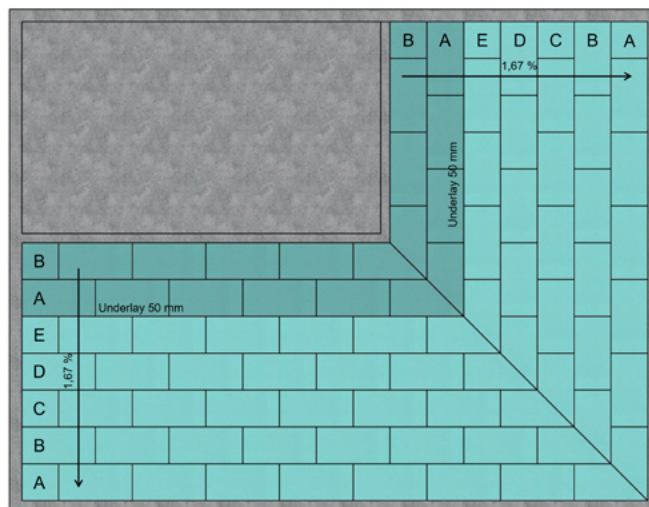
3.2.2. Bidirectional linear drainage

Much like the unidirectional linear drainage, bidirectional linear drainage follows the same logic on both sides of the thermal insulation ridge, creating two inclination planes similar to a ridge on a sloped roof.



Picture 15: Bidirectional linear drainage

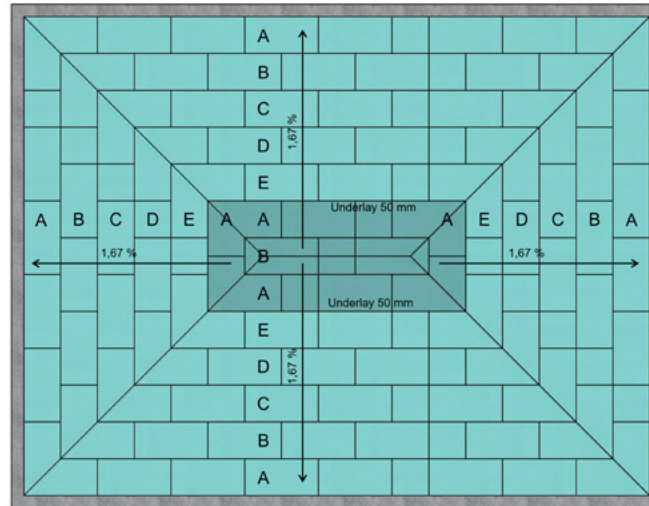
Picture 16 shows a special case of bidirectional linear drainage with two linear drains positioned perpendicular to each other, as is often the case in terraces and balconies. Special attention must be paid to height levelling on both sides all along the valley. As a rule, the valley is positioned in the corner of the two drains.



Picture 16: A special case of bidirectional linear drainage

3.2.3. Multidirectional linear drainage

With linear drains positioned along the roof parapet walls, we have four roof valleys perpendicular to each other as shown on Picture 17, reminiscent of a pavillion roof.



Picture 17: Multidirectional linear drainage

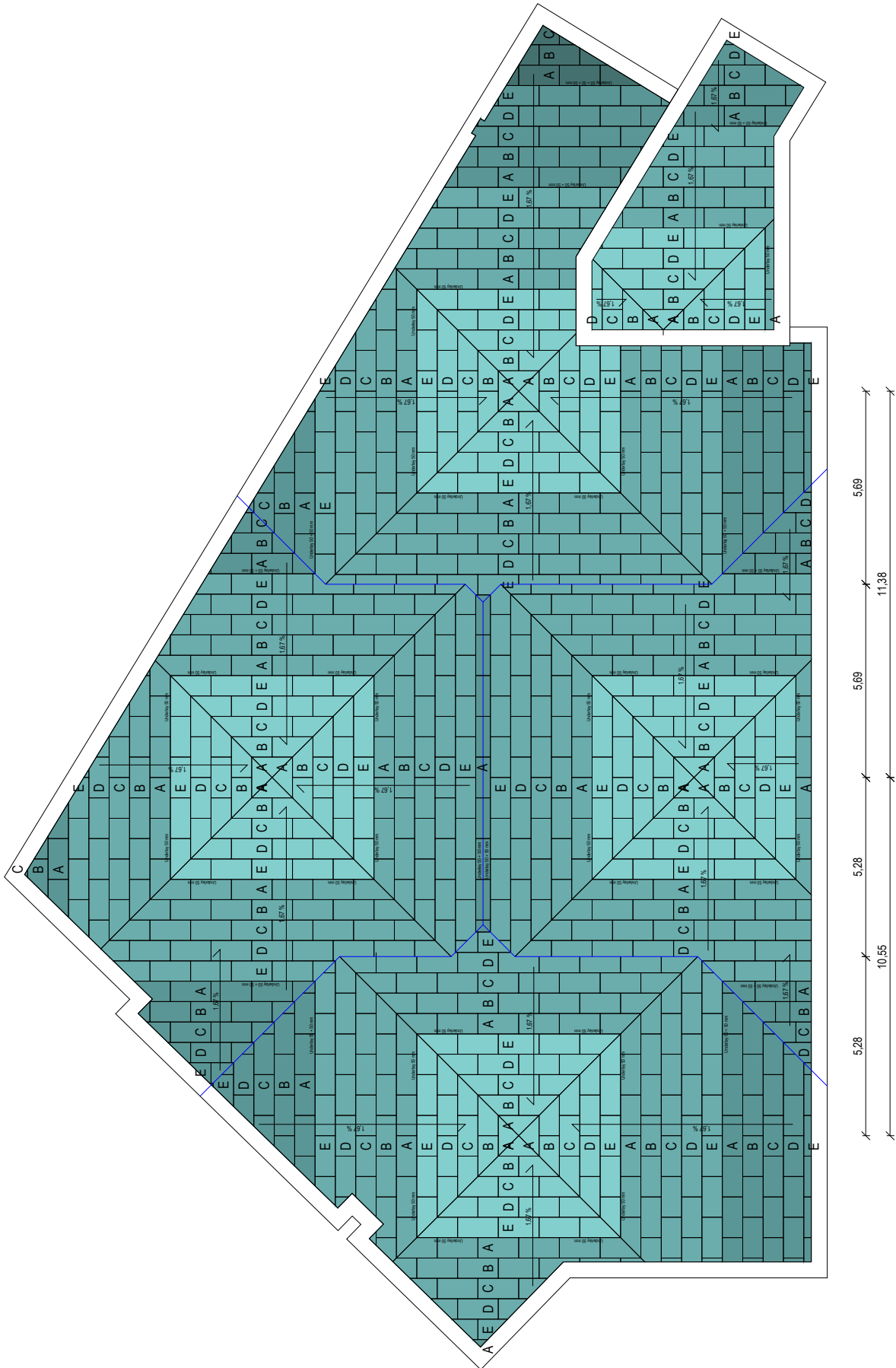
4. Recommendations and warnings

Hot wire cutters are recommended for exact cutting of XPS boards. When working with XPS thermal insulation, open fire must be avoided. As PVC or other membranes must not be laid directly on XPS boards, a separation layer must be placed over the boards prior to laying the foils.

Free installation plan

FIBRAN d.o.o. supplies all buyers of the FIBRANxps INCLINE thermal insulation with a free individual installation plan. It can be drawn up also in the design phase to ensure such drain positioning as to make optimal use of the FIBRANxps INCLINE system. Contact us for more information at nasvet@fibran.si.

5. An example of a free installation plan





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The quality of FIBRANxps products is assured by EN 13164 and EN 13172 standards. These standards establish the type and frequency of measurements executed by accredited and independent institutes, as well as by FIBRAN laboratories. Since FIBRAN sells its products throughout Europe and outside its borders, the quality of products is also verified according to local standards of certain countries including some highly developed and specially demanding construction markets.

fibran

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