



**LINZMEIER**

Insulate with system

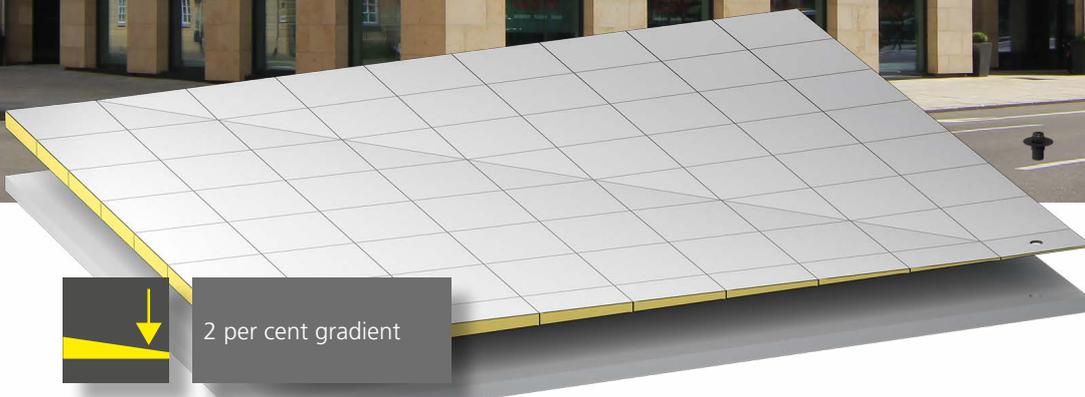
## Safe Protection across the board

Insulating up to 9.6 m with a single layer gradient

Flat roof insulation

**LINITHERM®**

PAL gradient  
PGV gradient



2 per cent gradient



Little weight &  
pressure resistant

Excellent thermal insulation  
(up to  $\lambda_D$  0,022 W/(mK))

With gradient ridge and  
valley boards

Safe and easy installation

Provides a wide range of laying  
and drainage methods



Meets the QNG requirements for prevention of hazardous substances in insulants. "pure life" is a seal of approval issued by the UGPU association.

[www.Linzmeier.de](http://www.Linzmeier.de)

# Insulating with a gradient. For durable and en

## LINITHERM – for flat roofs with more quality of life

Flat roofs are among the most economical roof type constructions. Apart from optimal use of space they also offer more application options for residential and commercial buildings. Flat roofs can be turned into patios, green spaces, or walk-in rooftop gardens

## LINITHERM gradient insulation

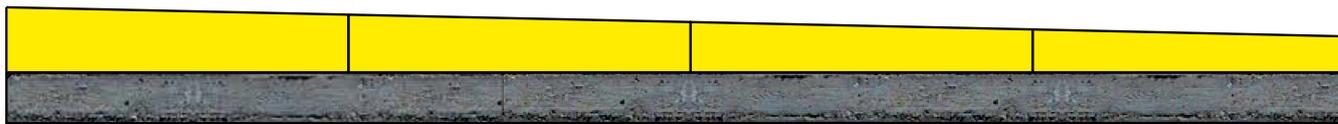
One of the greatest challenges of flat roofs is the fact that water may accumulate. As an expert in durable, value-preserving insulation with high energy savings, LINZMEIER has developed a simple yet ingenious solution for this challenge.

## Bevelled insulation panels perfectly complementing each other

LINITHERM gradient insulation uses bevelled insulation panels to create a slight gradient during installation. Rain and condensate flow to the drain at the lowest point of the roof.

The panels have coordinated start and finish dimensions. Thanks to eight different panel thicknesses you can create a tightly insulated space of up to 9.6 m in length. If your roof is longer or wider, use two or more layers of our system. This panel-based design eliminates the need for time-consuming specialised orders, guaranteeing shorter delivery times and a fast installation workflow.

230 mm



9.60 m

- Durable high-quality solutions
- Optimum heat and cold protection
- Thin, yet with excellent insulating properties
- Lightweight
- Quick and easy installation
- Resistant to deformation and dimensionally stable
- No decomposition or slumping down
- Humidity- and mildew-resistant
- Low emission
- Biocide-free
- Positive life-cycle assessment
- 100 % recyclable
- For sustainable building projects



# energy saving flat roofs

## High-performance PU rigid foam insulation material – for superior thermal insulation at minimal thicknesses.

The composite elements of the LINITHERM gradient insulation consist of LINZMEIER's high-performance PU rigid foam insulation material.

## Stay in shape for a building's entire lifetime

Its unique characteristics make PU rigid foam predestined for flat roofs: Even with excessive temperature variations, PU is dimensionally stable, does not slump down, and absorbs no humidity. This ensures consistently superior thermal insulation – for a building's entire lifetime, and longer.

## PU is a sustainable insulation material and environmentally friendly.

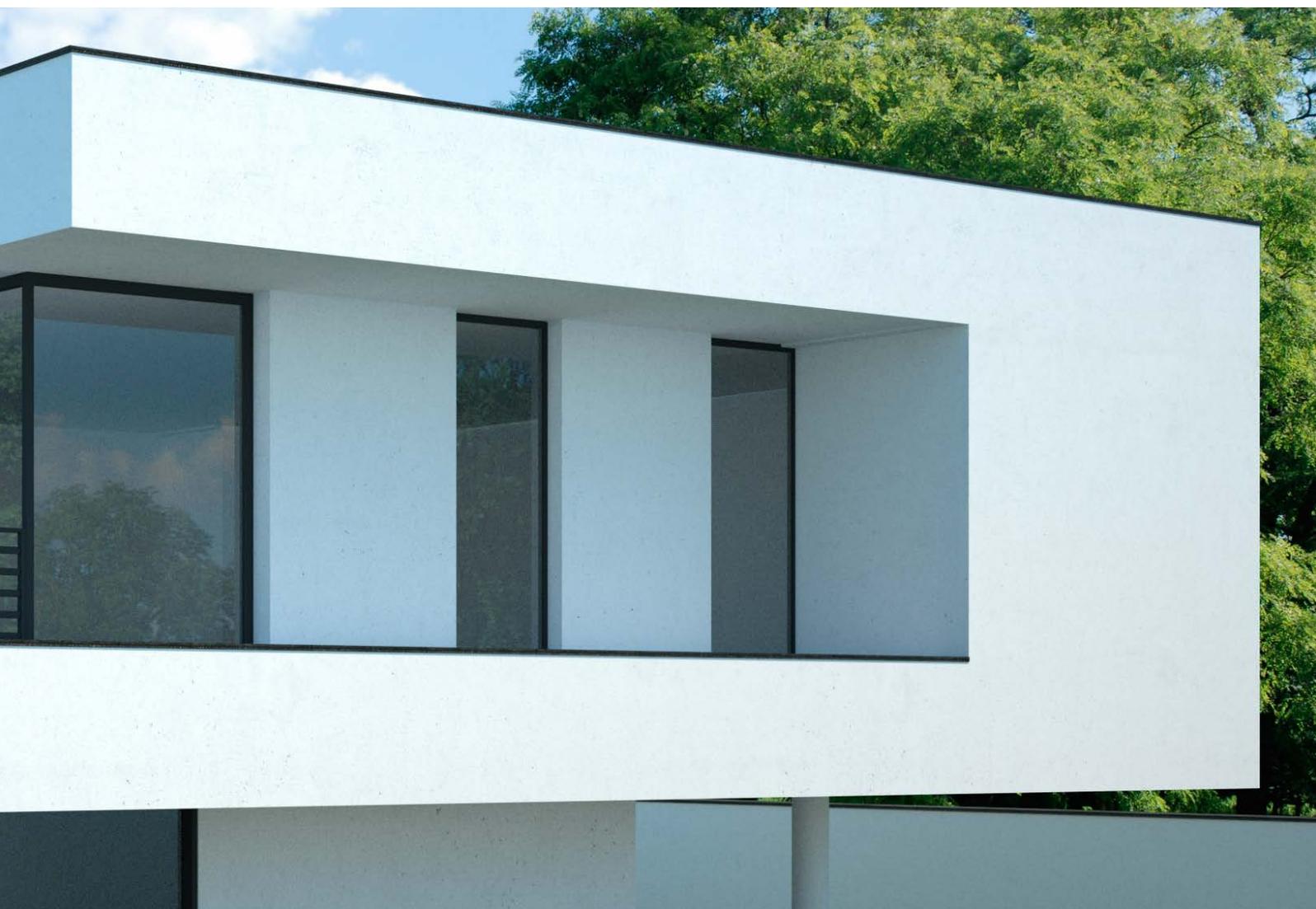
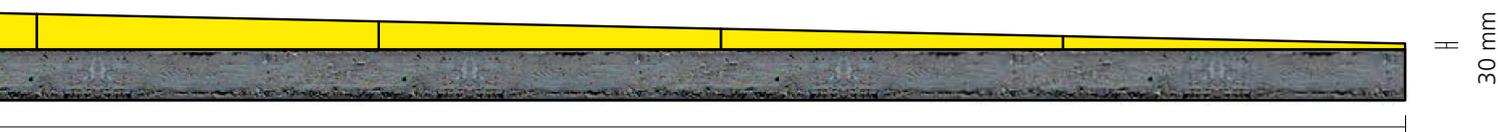
PU has an excellent energy balance. The energy consumed for manufacturing the insulation is generally saved within a single heating period. In addition, PU is 100 % recyclable.

Thickness comparison for a U-value of 0.18 W/(m<sup>2</sup>K)

LINITHERM  
120 mm  
TCL 022

Rock wool  
220 mm  
TCL 040

EPS  
220 mm  
TCL 040



# Design without compromise

## More space for aesthetically pleasing solutions

### **Lean layering and lightweight constructions**

LINITHERM gradient insulation eliminates the need for heavy constructions, such as a sloped screed. The excellent thermal insulation of rigid foam enables extremely lean insulation solutions – with all the visual benefits for aesthetically pleasing designs. In addition, insulation elements such as LINITHERM PGV gradient, which have a short-term resistance to hot bitumen of up to 250 °C, are very lightweight.

### **Short installation times and layout drawings as a service**

Thanks to the well designed installation system, extended planning effort is now a thing of the past. The insulation panels can be delivered at short notice and installed quickly without requiring any numbering. On request we can create a layout drawing for your order as per your measurements.

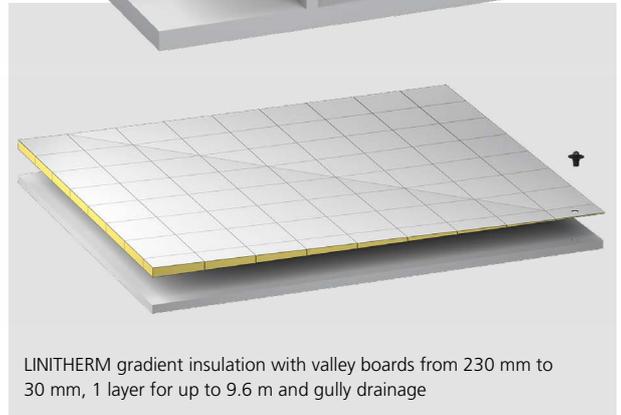
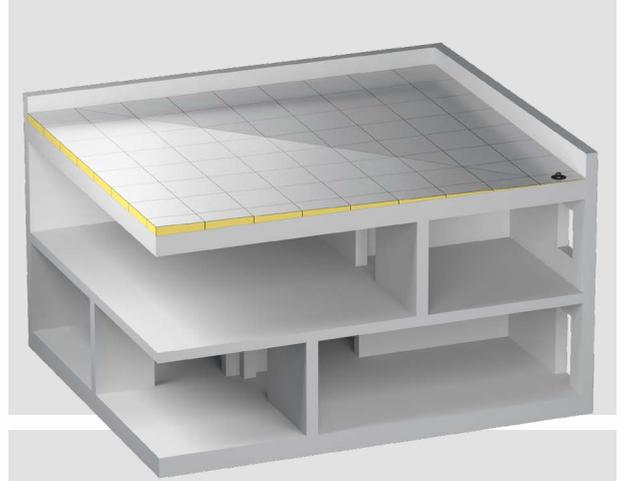


## Pressure-resistant ground for more usage options

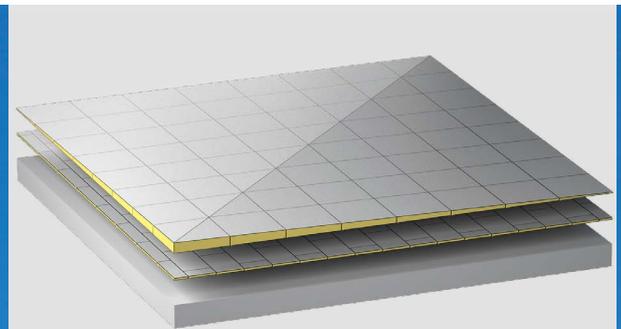
LINITHERM gradient insulation has excellent pressure resistance and can easily be covered by materials such as gravel or patio boarding. Even when the panels are uncovered you can walk on them while installing them without risking any damage or leaving »trails«. This makes them the ideal base for green roofs, patio boarding, or gravel, and an energy-proof solution for storeys not covering the entire floor space.

## Customised layering

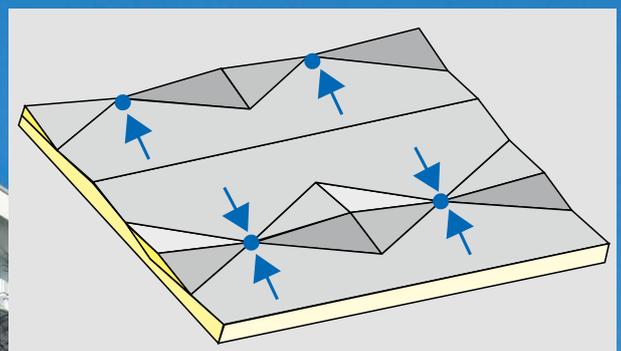
A single insulation layer already achieves best insulation values. If you require a very high level of thermal insulation or need to cover widths of more than 9.6 m, install two layers: one layer of LINITHERM flat roof insulation and one layer of LINITHERM gradient insulation.



LINITHERM gradient insulation with valley boards from 230 mm to 30 mm, 1 layer for up to 9.6 m and gully drainage



LINITHERM gradient insulation with ridge boards from 230 mm to 30 mm, for improved U-value with end-to-end base for gutter drainage



LINITHERM PAL gradient insulation with pre cut PU ridge turrets for a point-accurate drainage of rain water



# Perfection on all sides

## Modular system for a variety of installation options

### Two product lines – two layering designs

LINITHERM gives you a choice. LINITHERM PAL gradient ( $\lambda_D$  0,022 W/(mK)), laminated on both sides with aluminum foil, enables single-layer insulation length of up to 9.6 m (two layers for length of +9.6 m). Thanks to its aluminum lining, this product line provides better thermal insulation.

LINITHERM PGV gradient ( $\lambda_D$  0,026/0,028 W/(mK)) is laminated on both sides with mineral fibre. In combination with LINITHERM flat roof insulation panels, the system meets the highest standards for heat and cold protection.

Both product lines offer square insulation panels but also valley boards and ridge boards, each with a 2 % gradient to the left and/or right, resulting in a wide variety of installation options for different drainage types.

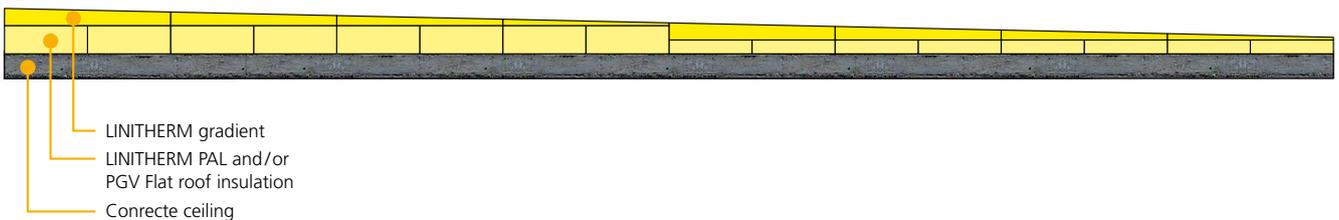
Layering principle 1: LINITHERM PAL gradient insulation, single layer for length of up to 9.6 m.



Layering principle 2: LINITHERM gradient insulation with end-to-end base for improved thermal insulation



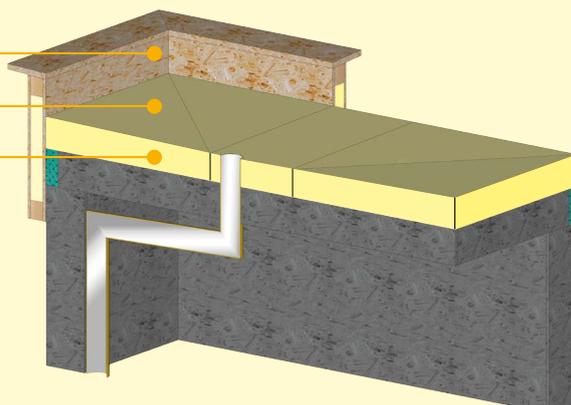
Layering principle 3: LINITHERM gradient insulation plus flat roof insulation



LITEC parapet element

LINITHERM PAL and/or PGV gradient

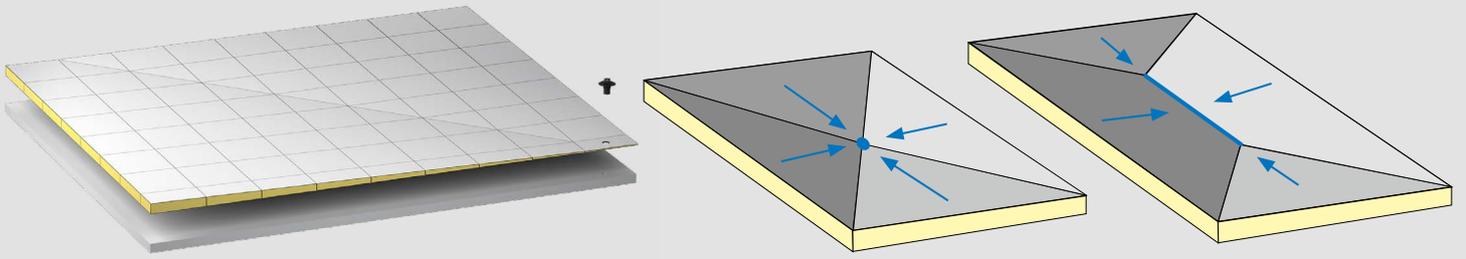
LINITHERM PAL and/or PGV flat roof insulation



For flat roof constructions »in one pour«:  
LITEC parapet element and LINITHERM gradient insulation

### LINITHERM plus LITEC – the perfect duo

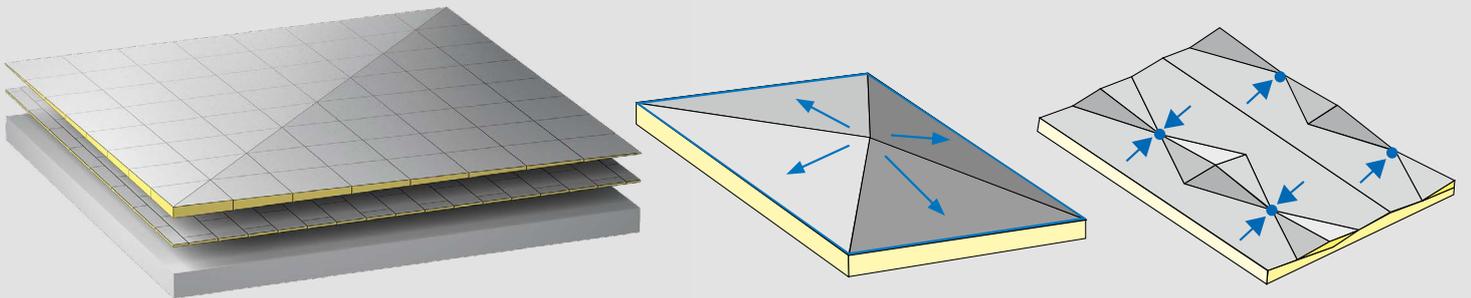
For quick and safe edge-of-roof designs, LITEC offers a two-piece parapet element. It is very robust, bears mechanical stress, and is easy to install. Fixing is done through wooden part.



Inside drainage with LINITHERM gradient insulation and valley boards

Point drainage with LINITHERM gradient insulation and valley boards

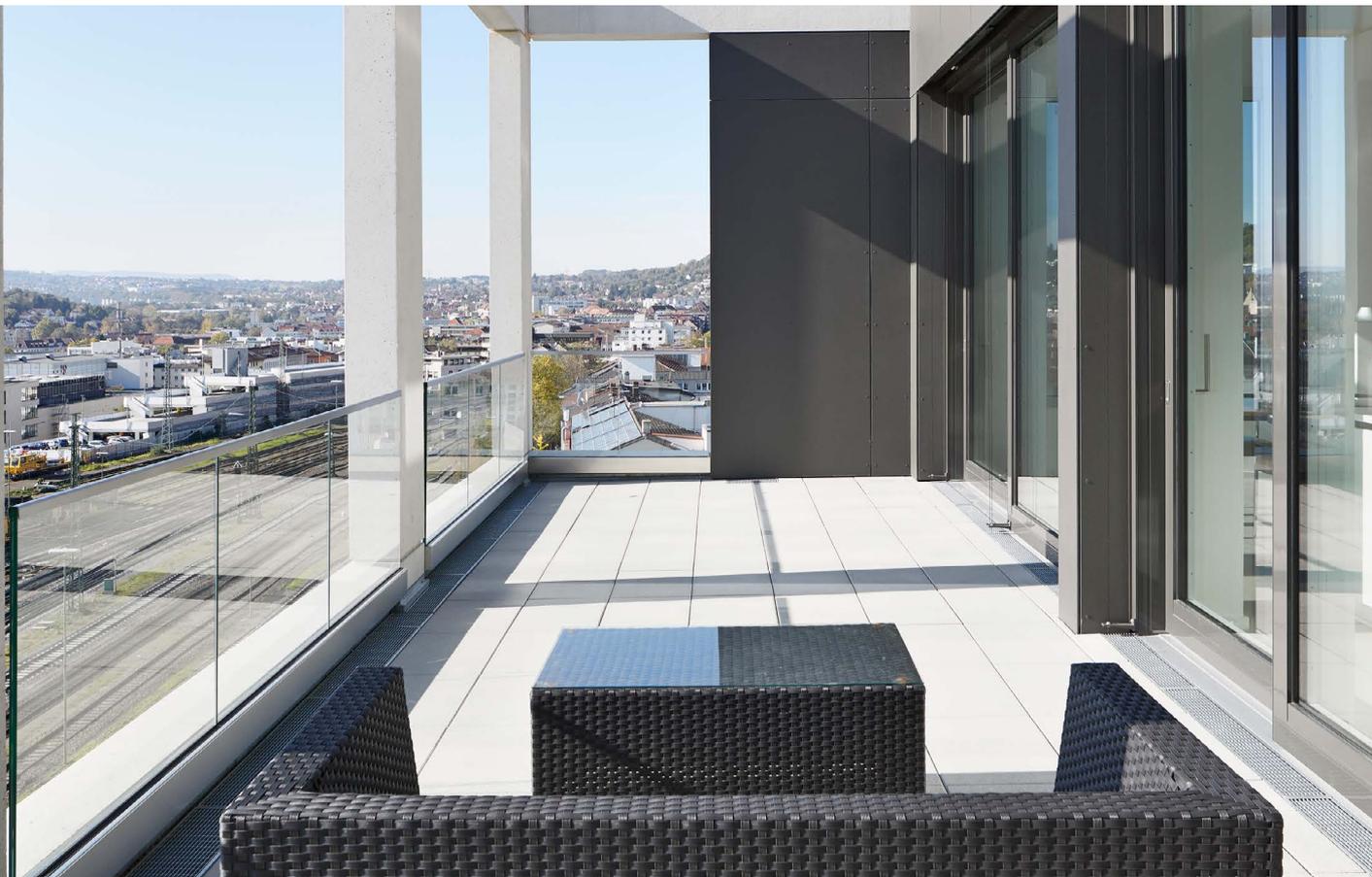
Inside drainage with LINITHERM gradient insulation and valley boards



Outside drainage with LINITHERM gradient insulation and ridge boards

Outside drainage with LINITHERM gradient insulation and ridge boards

Point drainage with LINITHERM gradient insulation and ridge turret

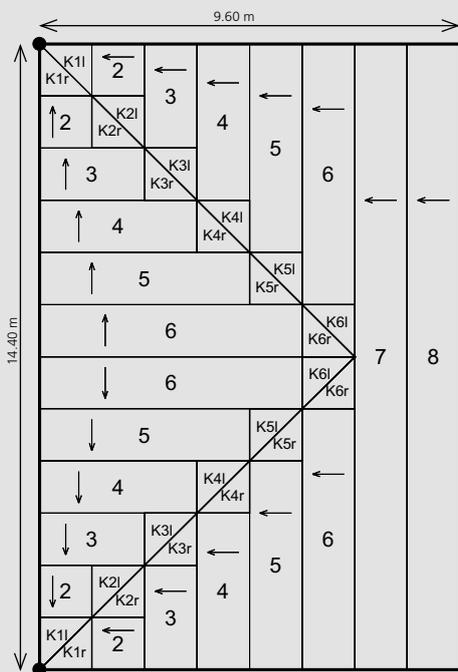


# Lightweight and handy Quick and safe installation

## Good-bye numbering – hello ease of installation

The gradient required by technical regulations is automatically created during the installation process. A simple and intuitive layout drawing is all you need. Our walk-in pressure-resistant insulation panels are another plus for efficient installation workflows. In no time at all you will have covered large areas. If necessary you can easily cut all the insulation panels to size, for example, to allow space for skylights.

### Plan example with valley boards



#### Example

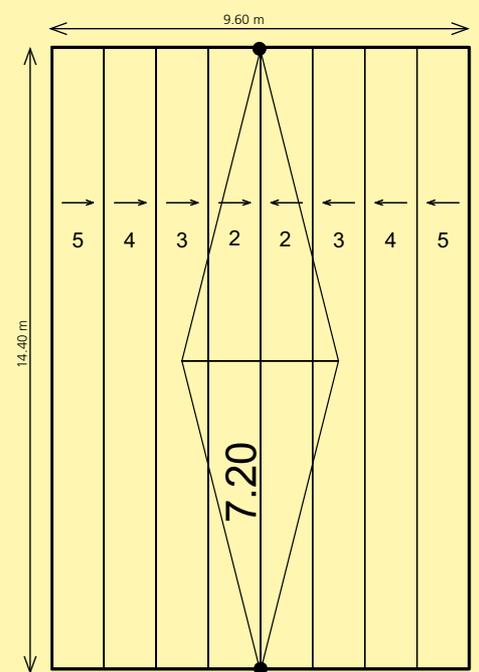
#### Layout drawing for LINITHERM gradient insulation with valley boards

1-layer installation  
up to 9.6 m

Gradient: 2.08%  
Min. height: 30 mm  
Max. height: 230 mm

Roof surface: 138.24 m<sup>2</sup>  
Weight: 685 kg  
U-value 0.19 W/(m<sup>2</sup>K)

### Plan example with ridge turret



LINITHERM PAL gradient insulation with ridge board – Grünes Zentrum Holzkirchen



Sloped roof with outside drainage – Grünes Zentrum Holzkirchen



## Including planning by LINZMEIER

Please visit us online for a check list for measurements. Sketch the positions of light domes, chimneys, or other structures such as lift shafts accurate to size. We will create an exact layout drawing based on these dimensions and sketch.

## Plan example with ridge boards

### Example

#### Layout drawing for LINITHERM gradient insulation with ridge turret DR 7200

1-layer installation  
up to 9.6 m

Gradient: 2.08%  
Min. height: 80 mm  
Max. height: 180 mm

Roof surface: 138.24 m<sup>2</sup>  
Weight: 594 kg  
U-value 0.19 W/(m<sup>2</sup>K)

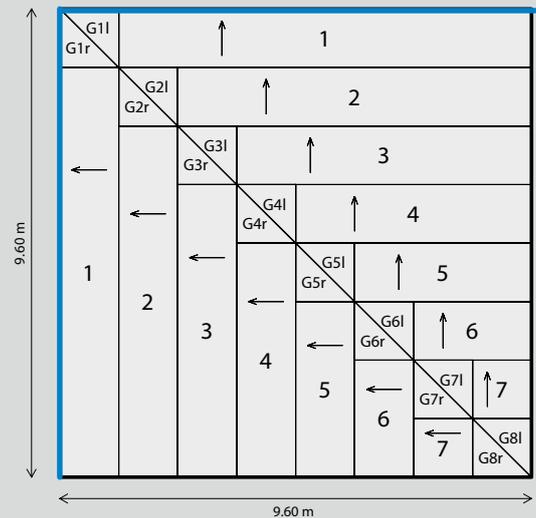
### Example

#### Layout drawing for LINITHERM gradient insulation with ridgeboards

2-layer installation with  
LINITHERM PAL flat roof  
insulation as first insulation  
layer

Gradient: 2.08%  
Min. height: 80 mm  
Max. height: 280 mm

Roof surface: 92.16 m<sup>2</sup>  
Weight: 455 kg  
U-value 0.18 W/(m<sup>2</sup>K)



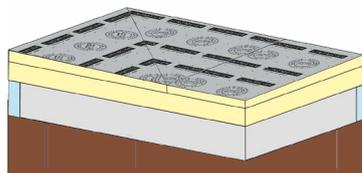
LINITHERM PGV gradient insulation with valley boards for outside drainage – Federseemuseum Bad Buchau



# LINITHERM PAL gradient

## Excellent thermal insulation and laminated with aluminum foil

PAL gradient insulation system for flat roofs



PAL gradient



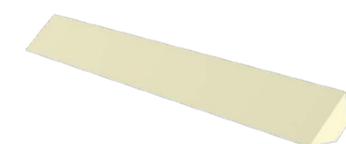
PAL gradient ridge and valley



PAL



PUR coign



### LINITHERM PAL gradient insulation system for flat roofs

PH 21500020

Gradient insulation system, consisting of basic insulation LINITHERM PAL (in case of multi-layer application), LINITHERM PAL gradient thickness from 30 mm up to 230 mm and LINITHERM PAL ridge/valley boards, according to gradient plan,

	Gradient %	$\lambda_D$ W/(mK)	Unit of quantity UQ
Insulation system	2	0,022	m <sup>3</sup>

### LINITHERM PAL gradient

PH 21500020

Insulation core	PU rigid foam acc. to DIN EN 13165, class E acc. to DIN EN 13501-1, coated with aluminum film on both sides, low-glare on one side
Edge joints	Round about edgeless cut
Overall dimension	1200 x 1200 mm

Thickness mm total	Gradient %	Quantity per pallet Piece	m <sup>2</sup>	$\lambda_D$ W/(mK)
30/55	2	48	69.1	0.022
55/80	2	32	46.1	0.022
80/105	2	24	34.6	0.022
105/130	2	20	28.8	0.022
130/155	2	16	23.0	0.022
155/180	2	12	17.3	0.022
180/205	2	12	17.3	0.022
205/230	2	8	11.5	0.022

### LINITHERM PAL gradient ridge/valley board 45° Angle

PH 21500020

Set consisting of ridge board left + right respectively valley board left + right, low-glare on one side

Thickness mm total	Gradient %	Quantity per pallet Sets	$\lambda_D$ W/(mK)
30/55	2	32	0.022
55/80	2	24	0.022
80/105	2	20	0.022
105/130	2	16	0.022
130/155	2	12	0.022
155/180	2	12	0.022
180/205	2	8	0.022
205/230	2	8	0.022

### LINITHERM PAL

< 80 mm PH 214000

Insulation core	PU rigid foam acc. to EN 13165, fire behavior class E acc. to EN 13501-1, coated with aluminum film on both sides, low-glare on one side
Edge joints	Thickness 20–40 mm: round about edgeless cut Thickness 50–100 mm: round about edgeless cut or with rebated joint Thickness 120–240 mm: round about rebated joint
Overall dimension	1200 x 600 mm (= calculation measurement) (coverage with rebated joint is 2 cm smaller)

Thickness mm total	Quantity per package Piece	m <sup>2</sup>	Quantity per pallet Piece	m <sup>2</sup>	$\lambda_D$ W/(mK)	U-value** [W/(m <sup>2</sup> K)]
80	6	4.32	60	43.2	0.022	0.26
100	5	3.60	50	36.0	0.022	0.21
120	4	2.88	40	28.8	0.022	0.18
140	3	2.16	36	25.9	0.022	0.15
160	3	2.16	30	21.6	0.022	0.13
*180	2	1.44	28	20.2	0.022	0.12
*200	2	1.44	24	17.3	0.022	0.11
*220	2	1.44	20	14.4	0.022	0.10
*240	2	1.44	20	14.4	0.022	0.09

Other thicknesses on request/Delivery only in full packages

### LINITHERM Coign Parapet wall-Coign (trapezoidal coign)

PH 215090

Insulation core	PU rigid foam acc. to DIN EN 13165, class E acc. to DIN EN 13501-1
Format	Length 1200 mm

Measurement mm	Quantity per package	$\lambda_D$ W/(mK)
50 x 50	100	0.028
80 x 80	72	0.028
100 x 100	50	0.028

Full wedge or other thicknesses upon request/Delivery only in full packages

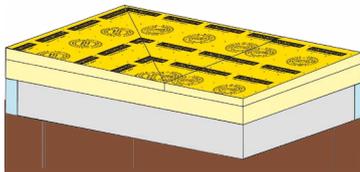
\* Might have longer delivery times.

\*\* U-value calculation takes the thermal resistances  $R_{si} = 0.1$  [m<sup>2</sup>K/W] and  $R_{se} = 0.04$  [m<sup>2</sup>K/W] into account. Building-specific characteristics for example as per DIN EN ISO 646 are not taken into account.

# LINITHERM PGV gradient

## Heat-resistant and laminated with mineral fibre

PGV sloped roof insulation



### LINITHERM PGV gradient insulation for flat roofs

PH 21500020

Gradient insulation system,  $\lambda_D$  0.026/0.028, consisting of basic insulation LINITHERM PGV, LINITHERM PGV gradient and LINITHERM PGV ridge/valley boards, according to gradient plan.

	Gradient %	$\lambda_D$ W/(mK)	Unit of quantity UQ
Insulation system	2	0.026/0.028	m <sup>3</sup>

PGV gradient



### LINITHERM PGV gradient

PH 21500020

Insulation core	PU rigid foam acc. to DIN EN 13165, class E acc. to DIN EN 13501-1, thickness 5/30 mm unlaminated, other thicknesses coated with mineral fleece on both sides
Edge joints	Round about edgeless cut
Overall dimension	1200 x 1200 mm

Thickness mm total	Gradient %	Quantity of pallet Piece	m <sup>2</sup>	$\lambda_D$ W/(mK)
5/30	2	116	167.0	0.028
30/55	2	48	69.1	0.028
55/80	2	32	46.1	0.028
80/105	2	24	34.6	0.026
105/130	2	20	28.8	0.026

PGV gradient ridge and valley



### LINITHERM PGV gradient ridge/valley board 45° Angle

PH 21500020

Set consisting of ridge board left + right respectively valley board left + right

Thickness mm total	Gradient %	Quantity of pallet Sets	$\lambda_D$ W/(mK)
5/30	2	38	0.028
30/55	2	32	0.028
55/80	2	24	0.028
80/105	2	20	0.026
105/130	2	16	0.026

PGV



### LINITHERM PGV

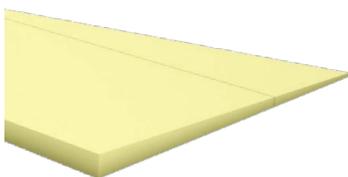
< 80 mm PH 214000

Insulation core	PU rigid foam acc. to EN 13165, fire behavior class E acc. to EN 13501-1, coated with mineral fleece on both sides
Edge joints	Thickness 20–40 mm: round about edgeless cut Thickness 50–100 mm: round about edgeless cut or with rebated joint Thickness 120–240 mm: round about rebated joint
Overall dimension	1200 x 600 mm (= calculation measurement) (coverage with rebated joint is 2 cm smaller)

Thickness mm total	Quantity per package Piece	m <sup>2</sup>	Quantity per pallet Piece	m <sup>2</sup>	$\lambda_D$ W/(mK)	U-value** [W/(m <sup>2</sup> K)]
80	6	4.32	60	43.2	0.026	0.31
100	5	3.60	50	36.0	0.026	0.25
120	4	2.88	40	28.8	0.025	0.20
140	3	2.16	36	25.9	0.025	0.17
160	3	2.16	30	21.6	0.025	0.15
*180	2	1.44	28	20.2	0.025	0.14
*200	2	1.44	24	17.3	0.025	0.12

Other thicknesses upon request/Delivery only in full packages

Ridge turret DR



### LINITHERM Ridge turret DR

DR PH 21500020

Insulation core	PU rigid foam acc. to DIN EN 13165, class E acc. to DIN EN 13501-1, B2n. DIN 4102-1 unlaminated
Edge joints	Round about edgeless cut

Thickness mm total	Length mm	Width mm	$\lambda_D$ W/(mK)
Ridge turret DR1200	1200	300	0.027
Ridge turret DR2400	2400	600	0.027
Ridge turret DR3600	3600	900	0.027
Ridge turret DR4800	4800	1200	0.027
Ridge turret DR6000	6000	1500	0.027
Ridge turret DR7200	7200	1800	0.027
Ridge turret DR8400	8400	2100	0.027
Ridge turret DR9600	9600	2400	0.027
Ridge turret DR10800	10800	2700	0.027

\* Might have longer delivery times.

\*\* U-value calculation takes the thermal resistances  $R_{s_i} = 0.1$  [m<sup>2</sup>K/W] and  $R_{s_e} = 0.04$  [m<sup>2</sup>K/W] into account. Building-specific characteristics for example as per DIN EN ISO 6946 are not taken into account.

Flat roof insulation

**LINITHERM®**

PAL gradient  
PGV gradient



LINITHERM PGV gradient insulation  
Wannweil fire station

- 

2 per cent Gradient
- 

Optimum cold protection
- 

Optimum heat protection
- 

Moisture resistant
- 

Thin with maximum insulation
- 

Little weight & pressure resistant
- 

Odorless & physiologically safe
- 

Recyclable
- 

Cuts costs, ensures excellent ROI
- 

Positive building biology

**LINZMEIER**

Insulate with system

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