VARIO*PAD* 2

Prod. no. 4022514***192169***

(can be split)

Height-adjustable pedestal supports for concrete or ceramic paving on balconies, terraces and green roofs

PLATTEN *FIX*®

THE CONQUEROR OF GREAT HEIGHT DIFFE

Height-adjustable pedestals for supporting paved coverings on water-proofed flat roofs or concrete surfaces. The slabs can be laid without any protective layers between waterproof seal and pedestal pads.

Vario-Pad 2
(can be split)

Support: Ø 180 mm, 35 - 50 mm seamlessly height-adjustable.
Joint bar: height 65 mm, width 4 mm

4022514***192169***
Pack of 32

Made of polyamide and glass fibre (without any emollients), the Vario-Pad 2 has a robust, non-slip bottom, joint bars and adjustable tooth lock washers for seamless height adjustment from 35 to 50 mm.

Cross spacer with reverse motion locking for Vario-Pad 2

Total height: 60 mm. Length: 74 mm
Joint bar: height: 15 mm

4022514***192145*** (4 mm)
Pack of 50

4022514***192152*** (6 mm)
Pack of 50

Using the cross spacer (width of 4 or 6 mm possible) with reverse motion locking, which it is imperative you fit, you determine the joint width.

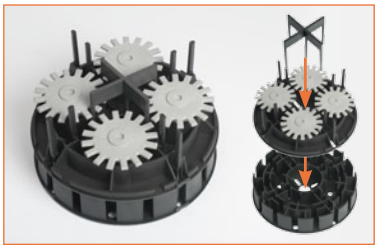
Use at the edge of slabs

For use at slab edges the wing (designed to be broken off) and its counterpart on the cross spacer for reverse motion locking are removed using wire cutters, as are the 2x2 joint bars on the Vario-Pad 2, which would otherwise end up underneath the slabs.

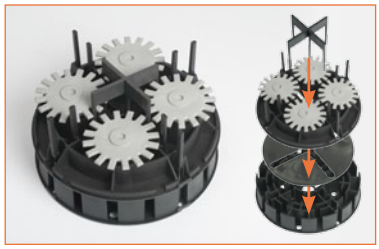
Combination possibilities

The Vario-Pad 2 can be combined with the Multi-Pad, the Multi-Pad+PLUS and the Maxi-Shim. To level out heights a maximum of 6 Multi-Pad and/or Multi-Pad+PLUS supports can be stacked on top of each other and laid with Vario-Pad 2 units.

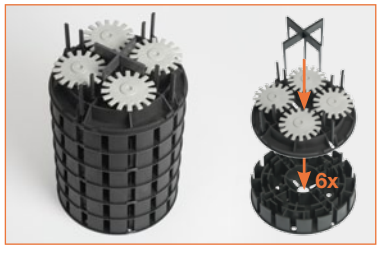
Vario-Pad 2 with reverse motion locking and Multi-Pad



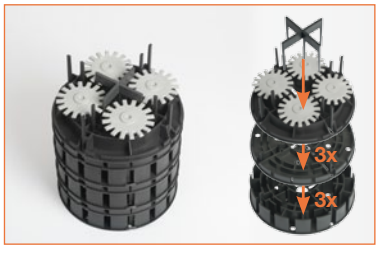
Vario-Pad 2 with reverse motion locking and Multi-Pad+PLUS



Vario-Pad 2 with reverse motion locking and Maxi-Shim and Multi-Pad+PLUS



Maximum height: Vario-Pad 2 with reverse motion locking and 6x Multi-Pad+PLUS



Vario-Pad 2 with reverse motion locking with 3x Multi-Pad and 3x Multi-Pad+PLUS

Vario-Pad 2 with reverse motion locking and Multi-Shim

ERENCES

VARIOPAD 2

Advantages

- Seamlessly height-adjustable from 35 – 50 mm (Minimum starting height of 35 mm and max. end height of 50 mm. Depending on size of slabs laid, a slope of 1.25% to 2% per metre can be levelled out.)
- You can choose joints of different widths (4 or 6 mm), thus ensuring no reverse motion (a cross spacer with reverse motion locking must always be fitted)
- Can be split (under certain conditions, see p. 17)
- Large support area and thus high l oad-bearing capacity
- Suitable for bridging big heights in combination with Multi-Pad and/or Multi-Pad+PLUS supports and Maxi-Shims
- Even pattern of joints
- Environmentally compatible
- Good water drainage
- The individually height-adjustable cogwheels enable you to adjust each corner in height separately in order to equal out slabs of differing thicknesses as well.
- No raised slabs due to ice

Material:

Polyamide (PA 6), glass-fibre-reinforced, reusable, recyclable

Polyamide (PA 6), reinforced with 25% glass fibre (PA 6 GF25)

Gross density: 1.32 g/cm³

Resistant to deformation from -40 to +130°C

Load-bearing capacity: *

35 mm cogwheel height
= 19.2 kN per cogwheel × 4 = 78.80 kN / pad

50 mm cogwheel height
= 13.6 kN per cogwheel × 4 = 54.40 kN / pad

(Tested at 23°C and 50% relative air humidity)

Dimensions:

1) Vario-Pad 2

Ø 180 mm
Total area 254 cm² (area for the calculated thermal insulation pressure resistance = 230 cm²)

Seamlessly height-adjustable from 35 to 50 mm

Four cogwheels individually adjustable in height, each Ø 65 mm

Joint bar: height 65 mm

2) Cross spacer with reverse motion locking

Height 60 mm, length 74 mm

Joint bar: height 15 mm,
width 4 mm (prod. no. 4022514*192145*) or
width 6 mm (prod. no. 4022514*192152*)

Can be used for concrete or ceramic slabs
Can be combined with Multi-Pad and Multi-Pad+PLUS supports and with Multi-Shims.

Essential they are fitted!

What you need:

Slab format (cm)	Paving slab pads needed per m²	Slab format (cm)	Paving slab pads needed per m²
80 x 80	1.56	30 x 60	5.55
60 x 60	2.77	50 x 50	4
40 x 120	2.08	40 x 40	6.25
40 x 80	3.13	30 x 30	11.11
40 x 60	4.16		

Note: more whole slab pads are needed at the edges of the area covered!

* Tested by F+E Ing. GmbH – plastics laboratory on 24.06.2015

STABILITY AND BALANCE ON BALCONIES

Using the height-adjustable Vario-Pad 2 paving slab supports, you can configure paving correctly and in accordance with standards and norms on balconies, terraces and green roofs.

The rules and regulations applicable to balconies, terraces and green roofs are the roofing trade rules for waterproof coverings (utilised roofs) and especially the flat roof guidelines and DIN 18195 (waterproofing of buildings) parts 5 and 9, relating to people being present on them.

All notes of guidance listed here are based on the guidelines already mentioned in the first paragraph.

- As paved surfaces on pedestal supports with open joints have to be laid on a very stable surface, the only material permitted by DIN EN 1991-1 (formerly DIN 1055/3: load bearing in building construction - balconies and terraces) to be chosen as thermal insulation is an appropriate insulating material with a very high load-bearing capacity (XPS), as this material has to absorb the downward loads that would otherwise be absorbed by the concrete slab.
- Roof waterproofing seals overlaid with slabs made of non-flammable materials fulfil the specifications for 'hard roofing' required by the guidelines.
- When using many paving slab supports, there must be an appropriate separating layer on the seal underneath the paved covering. Observe the manufacturers' instructions in relation to the sealing membranes and paving slab pads. With Vario-Pad 2 supports no protective layer has to be laid on the seal.
- The edging and connecting areas of paved coverings are to be configured in such a way that any physical damage to the waterproof seal is permanently prevented and that they are so stable that the paving is held firmly in place all around and in combination with the cross spacers to be used **cannot shift** upon utilisation of the surface areas.
- To protect from splashes and overflows, the height of the junctions with any rising structural elements must be at least 15 cm above the top edge of the covering (paving / green roof). The junctions must be secured against slipping and against water running down behind them. They must also be protected against physical damage (e.g. with flashing).
- Junctions with doors should also be raised up to 15 cm and be treated in the same way as junctions with rising structural elements. The junction height can be reduced to a maximum of 5 cm if it is assured that in the area around the door water is able to run away freely at all times and the issue of splashing water is thus minimised. This is the case, for example, when fitted in the immediate area of the door there is a grate-covered trough-shaped drain connected directly to the drainage system.
- Wheelchair-accessible crossovers require special solutions in relation to waterproof seals. These must be agreed between planners, door manufacturers and the manual trades carrying out the work. For further notes of guidance please refer to the rules on sealing used surfaces.

- The height of the waterproof seal on roof-edge junctions – just as parapets – must be at least 10 cm above the top edge of the covering (paving / green roof).
- Roof-edge junctions around gutters (in the area of the eaves) are to be configured such that there is a rigid, firm edge that can be used for the paving to butt up against, but not in such a way that surface drainage off the waterproof seal is prevented.
- In the case of balconies, terraces and green roofs, removable grilles (available as drainage system components from many manufacturers) must be fitted over roof drains, emergency drains and emergency overflows.
- Appropriate care and maintenance is required to preserve roof seals. For details, refer to the industry rules for such seals.
- In the case of balconies and terraces exposed to the weather, the paved coverings must be divided into small sections in order to avoid any formation of cracks caused by thermally-induced changes in length. However, this does not work forever. Once such cracks have occurred, moisture penetrates into the joints, the covering rises due to freezing and thus gets destroyed.
- In order to avoid such damage, paved coverings should be laid on balconies, terraces and green roofs with open joints of different widths, preferably 4 to 6 mm, thus ensuring that surface water gets fed under the paving through the open joints. Any fine dust that has accrued thus also gets carried away with the water and a clean surface results.
- Paved coverings on balconies and terraces reduce the thermal strain on the seal caused by sunshine, rain or snow.

Conclusion

- What is created is paving with open joints (generally 4 to 6 mm) that is dry, clean and thus safe and pleasant to walk on.
- The seal can be made using bitumen or plastic sheeting.
- No frost damage occurs, nor does any efflorescence appear on the paving, as there are no mortar joints to release any cement or calcium carbonate.
- The joints do not clog up, allowing the fine dust to be rinsed away along with the rainwater.
- Using additional pads of different heights, it is possible to a set degree to level the paving out.
- Cable ducts and other supply feeds, such as hoses or the like, can be laid out of sight under the paving.
- For any later maintenance work or any repairs that may become necessary, the paving can be easily taken up and after the work has been done equally easily laid back down again.

LAYING SLABS BY PLAN

1. Checks of the on-site circumstances

- Condition of the existing roof membranes set / waterproof seal.
- Appropriate suitability of the thermal insulation fitted / to be fitted
- Loading of the bottom concrete sections by the roof membranes potentially checked and approved by a structural engineer
- Quality of work done by any prior contractor
- When laying paved coverings on pedestal supports / pads on balconies or terraces it is **ESSENTIAL** that you ensure that a form of thermal insulation is used that is highly resistant to compression. The thermal insulation panels appropriate for this use, such as **XPS or cellular glass** are listed in a table on pages 16 and 17.

! Pursuant to VOB part B, Art. 4, point 3, any mistakes made by the prior contractor that can be detected by visual inspection or can be verifiably proven and that may impair the execution and function of subsequent work must be complained about in writing before you start your own work.

2. General conditions for the correct laying of paving on pedestal supports

Dimensions and weight of paving slabs
(dead weight loads as per DIN EN 1991-1-1/NA)

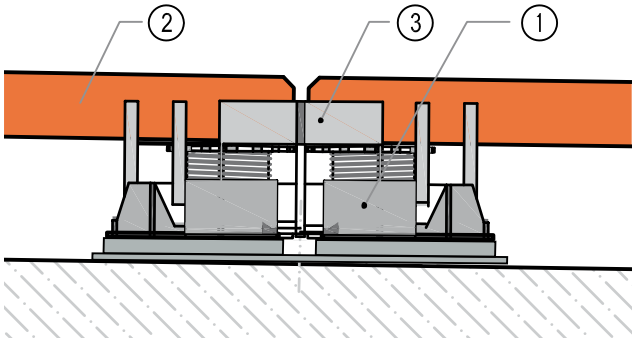
Paving type	Dimensions L x W x H [cm]	Dead weight [kN]
Concrete slabs	50 x 50 x 4.1	0.26
	40 x 40 x 4.1	0.16
Ceramic slabs	60 x 60 x 2.0	0.16
	80 x 40 x 2.0	0.14

Vertical load capacity
(Load capacities as per DIN EN 1991-1-1/NA)

Category	Use	Examples	Distributed load [kN/m²]	Point load [kN]
T2	Stairways and landings	Category B1*) stairways and landings with considerable foot traffic, B2 to E*) and all stairs that serve as an emergency exit	5.0	2.0
Z	Entrances, balconies and similar	Roof terraces, walkways, recessed and standard balconies, stair tower landings	4.0	2.0

* Building categories cf. DIN EN 1991-1-1/NA

3. Step-by-step laying of the components on the finished waterproof roof seal made of bitumen or of plastic sealing sheets (as specified by the manufacturer)



1	Vario-Pad 2 potentially in combination with Multi-Pad and/or Multi-Pad+PLUS
2	The paving
3	And finally, the cross spacers

! When using the pedestal pads made of polyvinyl chloride, as described here, there is **no requirement** on the part of Hans Kaim GmbH for any protective layer to be laid on top of the waterproof seal.

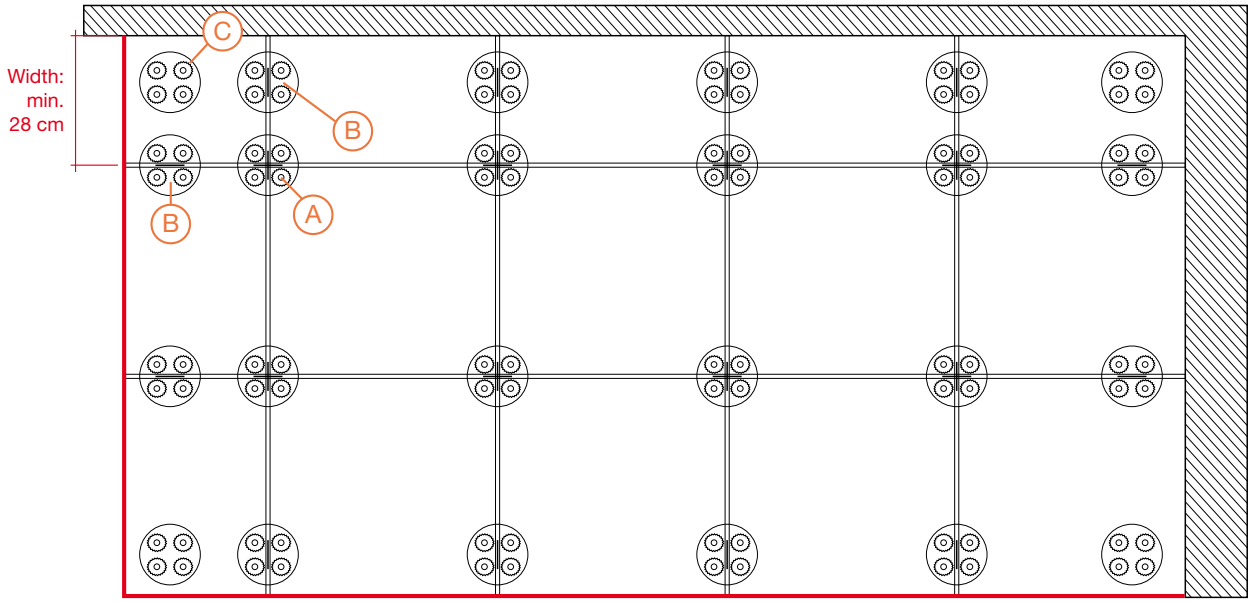
All junctions (with walls, doors, etc.) must be permanently protected against damage and it must be ensured that there is a fixed edge for the paving all the way around, so that it cannot shift in any direction.

A simple strip of gravel is not enough! What is needed here as a separation and fixed stop is, for example, a concrete block step laid lengthways. Alternatively, in the areas around the eaves, a robust, rigid edge made of angled steel or an appropriate flat steel bar.

These fixed, rigid borders should be individually adapted to the configuration and set-up of the balcony or terrace.

KEEPING PAVING SLABS IN BALANCE

4. Laying slabs



Secure the paving against side-shifting on all sides!

We recommend that first of all, using suitable tools and equipment, you sound out the maximum top edges of the paving so that you can see what height difference needs to be bridged using additional pads, such as Multi-Pad or Multi-Pad+PLUS supports.

You should then look for a crossways and lengthways side in order to establish a right angle here for starting to lay the slabs. We recommend using two outer edges (eaves/parapets or similar) in order to begin laying whole slabs, extending out from the edges, within the right angle.

(A) The slabs to be laid always have one corner lying on a quarter segment of paving pad; at the outer edges (B) a whole pad is likewise fitted, such that here the slabs lie fully on it on both sides and in the gap created you are able to secure two cogwheels with the cross spacer. To this end, you remove the wing, which is designed to be broken off, and its counterpart, thus creating a straight spacer that you fit as a reverse motion lock. Using a wire cutter, the joint bars are removed on the right and left side from the Vario-Pad 2 itself. In the area of the joints, however, the joint bars are left in place. If at the edge you are able only to fit a cut slab, narrower than 28 cm, what you do here is replace the Vario-Pad 2 with a combination of half Multi-Pad and/or Multi-Pad+PLUS units, adjusted where necessary to the appropriate height using a Maxi-Shim. If you do this, you remove the top pad's joint bars. (C) In the corners too you must fit a whole pad to ensure proper, DIN-compliant pressure distribution/dimensioning. A combination of Multi-Pad and/or Multi-Pad+PLUS units, where necessary with a Maxi-Shim, is used here to achieve the required height. Here too, however, the top pad's joint bars need to be removed.

Using a filler wire, you can turn the cogwheels to finely adjust the slab height.

The reverse motion lock gets inserted into the joint and prevents the wheels from subsequently moving out of position.

As the slabs are laid together tightly, you can use a 3-mm thick piece of wood and a small hammer as an extra aid for fitting the cross spacers.

Tools required for laying the slabs are a spirit level/straightedge, wire cutters, a filler wire of 3.2 or 3.5mm thickness, a small hammer and a piece of hardwood 3 mm thick. The spirit level/straightedge is needed in order to lay the paving horizontally level and truly aligned. The wire cutters are needed to shorten the joint bars (laying aid) on the Vario-Pad 2 and potentially the legs of the cross spacers. These jobs depend on the thickness of the paving material to be laid and on the height at which the VarioPad 2 is set. After laying the last slab on each complete pedestal support near a joint, you need the 3.2 or 3.5 mm filler wire in order to finely adjust the slabs by the cogwheels before fitting the cross spacer with reverse motion locking (to illustrate things better the fourth slab is absent from the pictures above).

! Please use the **EIGHT** joint bars on the Vario-Pad 2 as aids for butting up the paving slabs, in order when laying them to always keep at right angles from the outset.

These bars are ONLY a laying aid – NOT any form of reverse motion locking!

Once you have finished laying the first paving corner, you push the cross spacer into the joint from above as a reverse motion lock. As the slabs have to be laid really tightly up against the edges and each other, you can use a 3-mm thick piece of wood and a small hammer as an extra aid for fitting the cross spacers.

Now you continue laying, always in a pattern of four slabs.

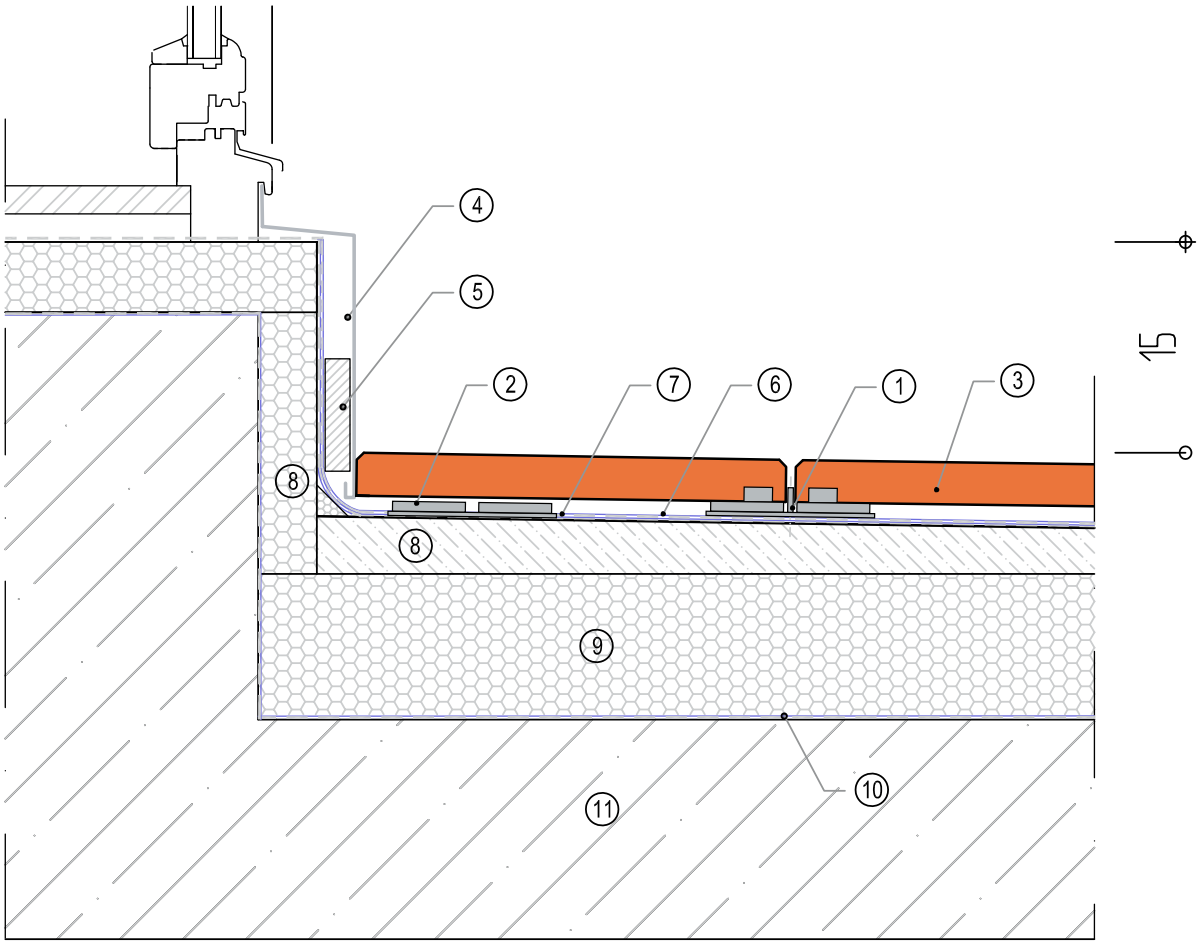
The slabs must be laid all around without any gaps or air at the outer edges. The flat roof guidelines therefore stipulate adequate long-lasting protection of the connections. The slabs must also be laid without any surface air gaps and with only the prescribed cross spacers as spacing.

The area to be paved should be divided up in such a way that no slab that gets cut to size is smaller than 28 cm.

VARIO*PAD* 2

Patio doors junction using a step profile on a flat roof

Non-binding example for the protection of the wall junction using a metal plate (see ④)



1	Standard-Pad / Maxi-Pad (Plattenfix)
2	Standard-Pad (Plattenfix) with no joint bars
3	Paving, self-supporting
4	Protective metal plate
5	Spacer (stuck on in a line)
6	Protective layer, made of raw glass matting with weight per unit area of at least 200 g/m²
7	Waterproof seal as per DIN 18195 parts 5 + 9 and flat roof guidelines
8	Sloped screed or tapered insulation with a slope of at least 2% per metre
9	Thermal insulation, highly compression-resistant XPS
10	Vapour barrier
11	Reinforced concrete, as per DIN EN 1991-1 (formerly DIN 1055-3)

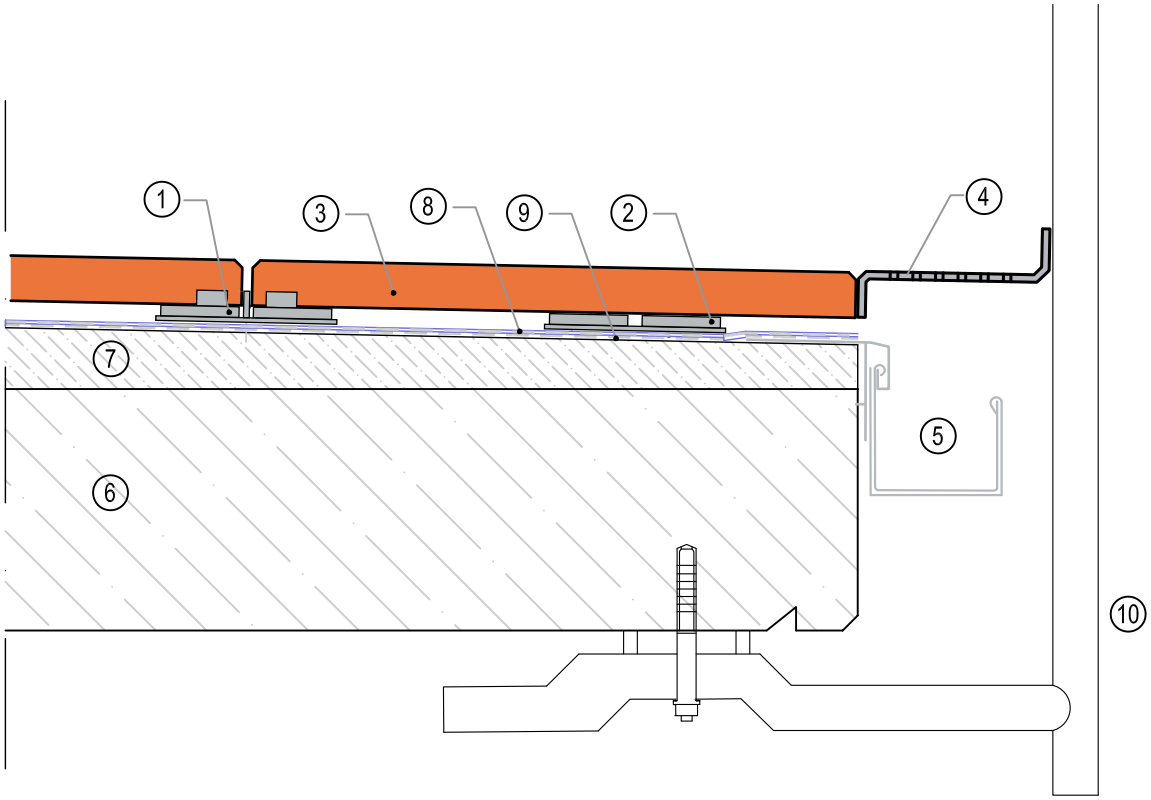
Note:

When using Standard-Pads or Maxi-Pads, you must lay a protective layer made of raw glass matting with a weight per unit area of at least 200 g/m² on top of the waterproof seal.

Please note the table on the pressure resistance of the calculated XPS insulation materials (see 'Basis for measurements' section on page 16)!

Edge finished with metal end plate on reinforced concrete balcony slab

Non-binding example for an eaves junction using angled steel (see 4)



1	Standard-Pad (Plattenfix)
2	Standard-Pad (Plattenfix) with no joint bars
3	Paving, self-supporting
4	Steel/stainless steel Z-shaped profile at least 5 mm thick as a rigid/fixed edge in the area of the eaves
5	Roof gutter with iron brackets
6	Reinforced concrete, as per DIN EN 1991-1 (formerly DIN 1055-3)
7	Sloped screed or tapered insulation with a slope of at least 2% per metre
8	Protective layer, made of raw glass matting with weight per unit area of at least 200 g/m²
9	Waterproof seal as per DIN 18195 parts 5 + 9 and flat roof guidelines
10	Steel or stainless steel balcony railing post

Note:

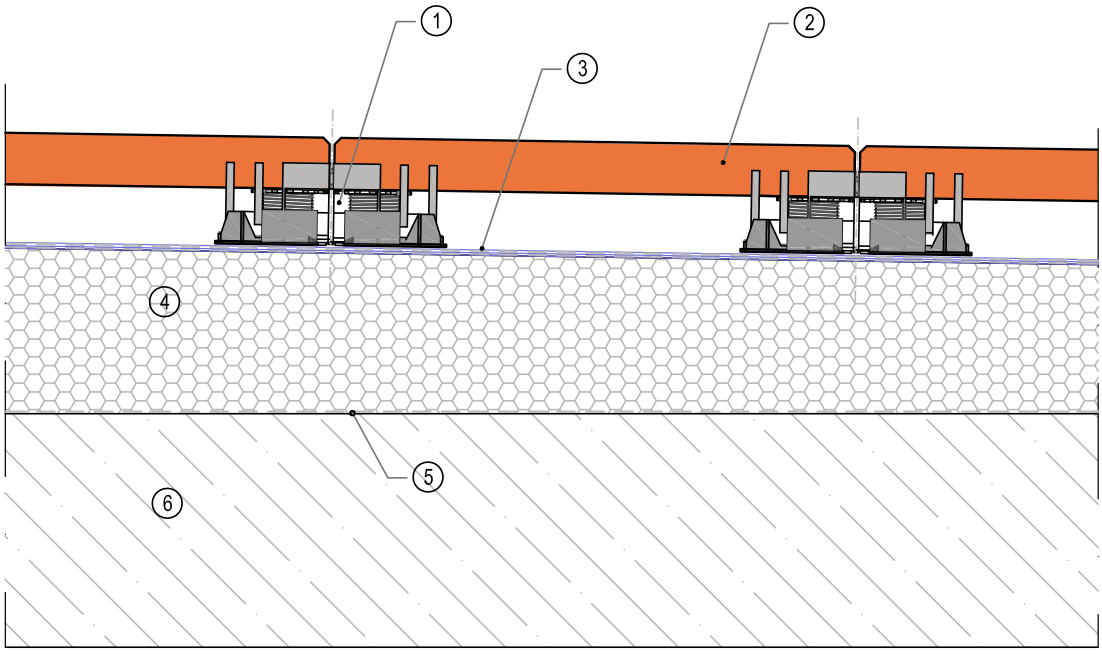
When using Standard-Pads or Maxi-Pads, you must lay a protective layer made of raw glass matting with a weight per unit area of at least 200 g/m² on top of the waterproof seal.

Please note the table on the pressure resistance of the calculated XPS insulation materials (see 'Basis for measurements' section on page 16)!

VARIO*PAD* 2

Paving on Vario-Pad 2 supports on non-insulated roof with tapered insulation

Suggested laying procedure



1	Vario-Pad 2, height-adjustable
2	Paving, self-supporting
3	Waterproof seal as per DIN 18195 parts 5 + 9 and flat roof guidelines
4	Tapered insulation with increased resistance to pressure (due to point loading)
5	Vapour barrier
6	Reinforced concrete, as per DIN EN 1991-1 (formerly DIN 1055-3)

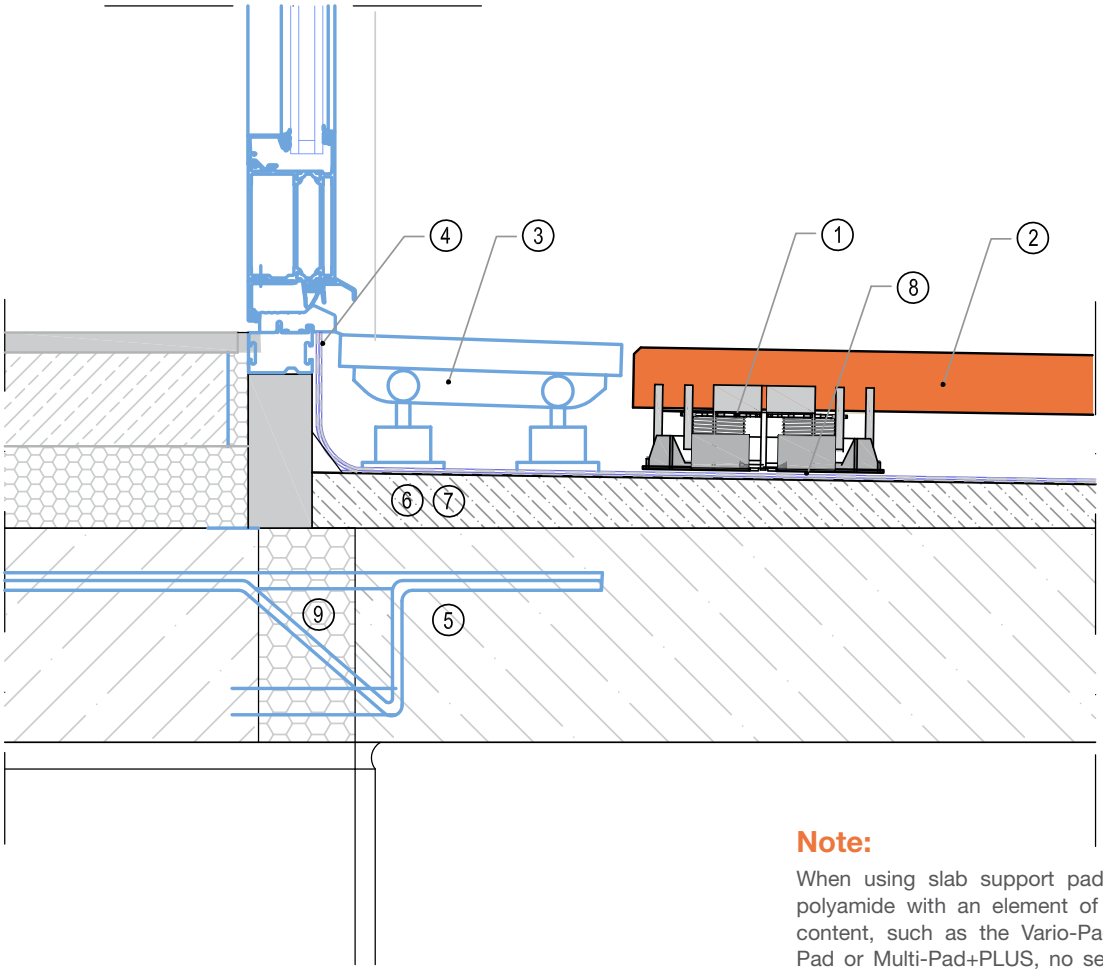
Note:

When using slab support pads made of polyamide with an element of glass fibre content, such as the Vario-Pad 2, Multi-Pad or Multi-Pad+PLUS, no separating or protective layer is required on top of the waterproof seal.

Please note the table on the pressure resistance of the calculated XPS insulation materials (see 'Basis for measurements' section on page 16)!

Patio door junction – wheelchair accessible with drain gulley

Non-binding example for creating a wheelchair-accessible crossover to a terrace door (see 4)



1	Vario-Pad 2, height-adjustable
2	Paving, self-supporting
3	Drain gulley, height-adjustable, with grate
4	Junction with terrace door, consisting of sealing membrane and protective metal plate
5	Reinforced concrete, as per DIN 1991-1 (formerly DIN 1055-3)
6	Sloped screed with a slope of at least 2% per metre
7	Alternatively: Tapered insulation with a slope of at least 2% per metre
8	Waterproof seal as per DIN 18195 parts 5 + 9 and flat roof guidelines
9	Isokorb for thermal separation

Note:

When using slab support pads made of polyamide with an element of glass fibre content, such as the Vario-Pad 2, Multi-Pad or Multi-Pad+PLUS, no separating or protective layer is required on top of the waterproof seal.

As per DIN 18195-5 and the 'Flat Roof Guidelines', wheelchair accessible cross-overs are special constructions/special waterproof seal solutions. They have to be agreed between planner, door manufacturer and the manual trades carrying out the work. For further information, please refer to the rules for seals on utilised surfaces.

Please note the table on the pressure resistance of the calculated XPS insulation materials (see 'Basis for measurements' section on page 16)!

INSULATION: STABILITY UNDER HIGH PRES

Sources for the bases on which to assess the appropriate XPS / cellular glass thermal insulation boards to be fitted

DIN 4108 – part 10, Areas of use,

DAA = External roof or ceiling insulation, protected from weathering, insulation underneath seals

DUK = External roof insulation, exposed to weathering (inverted roofs)

dh = High resistance to compression – utilised roof surfaces and terraces

ds = Very high resistance to compression – in addition to **dh** factory floors and parking decks as well

dx = Extremely high resistance to compression – in addition to **dh** and **ds** factory floors and parking decks bearing high loads as well

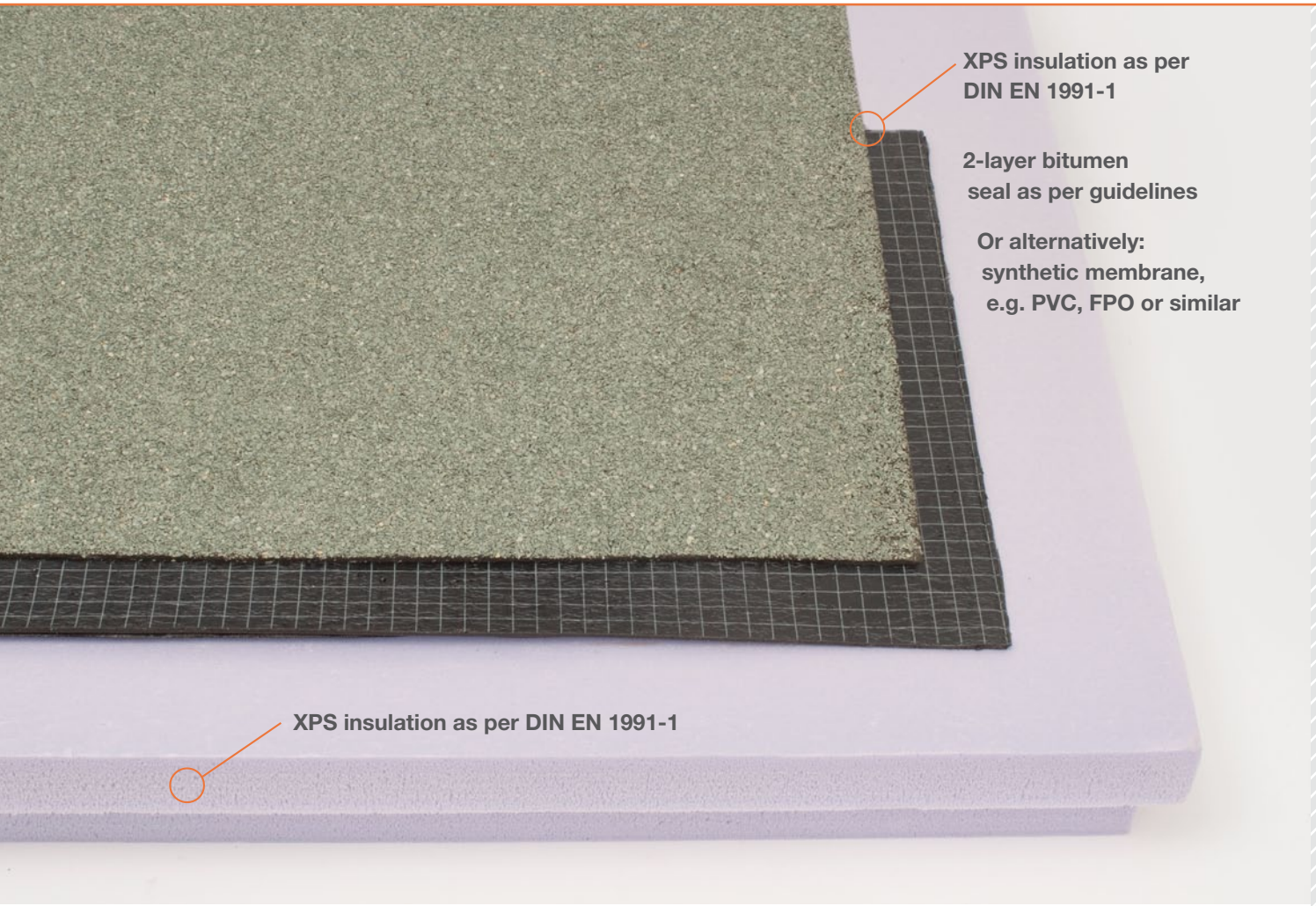
The thermal insulation to be fitted must be thoroughly checked in advance for its intended purpose, use and resistance to compression.

DIN EN 826 – Determination of compression strength at 10%
DIN EN 1606 – Determination of permitted compression strength for long-term loading at 50 years and max. 2% buckling

An important characteristic property for building materials is their resistance to compression. The compressive strength indicates the maximum load the material can bear.

Pursuant to DIN EN 826, the pressure test serves to assess the strength and deformation characteristics of hard foams under single-axis compressive loading. In accordance with the European product standard the manufacturer indicates the compressive / compression strength at 10% buckling in the naming code, e.g. CS (10\Y) 300. That means that the insulating material has a nominal compressive strength of 300 kPa. On an uneven or non-homogeneous sub-surface XPS behaves elastically. It does not have any tendency towards brittle fracture. Any concentrated loads therefore get absorbed by local deformation.

In the case of applications subject to compressive stress, insulating materials often get exposed to non-stop static and dynamic loading. The permissible compressive loads are worked out in accordance with DIN EN 1606. The permissible long-term compressive loads for the different types of XPS are between 60 and 250 kPa. At these levels of compression strength, the original thickness of the SPX is reduced over 50 years of use by not more than 2%. The manufacturer indicates the long-term compressive strength in the European product standard's name code, e.g. CC (2/1,5/50)180. That means that after permanent loading of 180 kPa for 50 years the thermal insulation material will be compressed by less than 2% of its initial thickness. Creep deformation here is less than 1.5%.



XPS thermal insulation with the example of bitumen seal

DIN EN 1991-1 – Effects on supporting structures (previous DIN: DIN 1055-3)

The basic principles relating to the effects on supporting structures of surface and civil engineering constructions inclusive of the geotechnical aspects are dealt with by DIN EN 1991-1 Eurocode 1: Actions on structures – General actions. This standard replaces DIN V EN 1991 and consists of a total of 7 parts:

DIN EN 1991-1-1: Densities, self-weight, imposed loads for buildings

DIN EN 02/01/1991: Actions on structures exposed to fire

DIN EN 03/01/1991: Snow loads

DIN EN 04/01/1991: Wind actions

DIN EN 05/01/1991: Thermal actions

DIN EN 06/01/1991: Actions during execution

DIN EN 07/01/1991: Accidental actions

INSULATION: STABILITY UNDER HIGH PRES

Research on the pressure resistance of thermal insulation materials

Recommended XPS / foam insulating materials for laying paving slabs on pedestal supports for balconies, terraces and green roofs

Product	Insulating material	Manufacturer	Pressure resistance Compression strength at 10% distortion [kN/m²]	Long-term pressure resistance 50 years long term, buckling <2% [kN/m²]
Austrotherm XPS Top 50, d = 50 - 120 mm (single layer)	XPS	Austrotherm	500	180
Austrotherm XPS Top 70, d = 80 - 120 mm (single layer)	XPS	Austrotherm	700	250
Jackodur KF 300 Standard, d = 50 – 120 mm (single layer)	XPS	Jackon Insulation	300/390	130
Jackodur KF 300 Standard, d = 140 – 300 mm (single layer)	XPS	Jackon Insulation	300/390	130
Jackodur KF 500 Standard, d = 50 – 120 mm (single layer)	XPS	Jackon Insulation	500	180
Jackodur KF 500 Standard, d = 140 – 300 mm (single layer)	XPS	Jackon Insulation	500	180
Jackodur KF 700 Standard, d = 50 – 120 mm (single layer)	XPS	Jackon Insulation	700	250
Jackodur KF 700 Standard, d = 140 – 300 mm (single layer)	XPS	Jackon Insulation	700	250
Styrodur 3000 CS, d = 40 – 120 mm (single layer)	XPS	BASF	300	110
Styrodur 3000 CS, d = 140 – 200 mm (single layer)	XPS	BASF	300	110
Styrodur 3000 CS, d = 40 – 120 mm (multi-layer)	XPS	BASF	300	110
Styrodur 3035 CS, d = 40 – 120 mm (single layer)	XPS	BASF	300	130
Styrodur 3035 CS, d = 140 – 200 mm (single layer)	XPS	BASF	300	130
Styrodur 3035 CS, d = 40 – 120 mm (multi-layer)	XPS	BASF	300	130
Styrodur 4000 CS, d = 40 – 120 mm (single layer)	XPS	BASF	500	180
Styrodur 4000 CS, d = 140 – 160 mm (single layer)	XPS	BASF	500	180
Styrodur 4000 CS, d = 40 – 120 mm (multi-layer)	XPS	BASF	500	180
Styrodur 5000 CS, d = 40 – 120 mm (single layer)	XPS	BASF	700	250
Styrodur 5000 CS, d = 40 – 120 mm (multi-layer)	XPS	BASF	700	250
Ursa XPS D N-III-L, d = 50 – 120 mm (single layer)	XPS	Ursa	300	130
Ursa XPS D N-III-L, d = 140 – 160 mm (single layer)	XPS	Ursa	300	130
Ursa XPS D N-III-L, d = 50 – 120 mm (multi-layer)	XPS	Ursa	300	130
Ursa XPS D N-V-L, d = 50 – 120 mm (single layer)	XPS	Ursa	500	180
Ursa XPS D N-V-L, d = 50 – 120 mm (multi-layer)	XPS	Ursa	500	180
Ursa XPS D N-VII-L, d = 50 – 120 mm (single layer)	XPS	Ursa	700	250
Ursa XPS D N-VII-L, d = 50 – 120 mm (multi-layer)	XPS	Ursa	700	250
Foamglas Platten T4+	Cellular glass	Foamglas	600	190
Foamglas Platten T4+	Cellular glass	Foamglas	900	250
Foamglas Platten F	Cellular glass	Foamglas	1600	380
Foamglas Floor Board T4+	Cellular glass	Foamglas	600	190
Foamglas Floor Board S3	Cellular glass	Foamglas	900	250
Foamglas Floor Board F	Cellular glass	Foamglas	1600	380

Measured value of the compression strength [kN/m²]	Note (Source)
255	Technical data / licence
340	Technical data / licence
175	Technical data / licence
140	Technical data / licence
250	Technical data / licence
210	Technical data / licence
320	Technical data / licence
255	Technical data / licence
150	Technical data / licence
150	Technical data / licence
150	Technical data / licence
185	Technical data / licence
185	Technical data / licence
185	Technical data / licence
255	Technical data / licence
255	Technical data / licence
255	Technical data / licence
355	Technical data / licence
355	Technical data / licence
185	Product data sheet
185	Product data sheet
185	Product data sheet
255	Product data sheet
255	Product data sheet
355	Product data sheet
355	Product data sheet
270	Product data sheet
350	Product data sheet
530	Product data sheet
270	Product data sheet
350	Product data sheet
530	Product data sheet

The thermal insulation's required minimum compressive strength

Dimensioning case (least favourable)*

Slab format [cm]	Definitive load condition	Thermal insulation's min. compressive strength [kN/m²]		
		Corner piece (57.5 cm²)	Edge piece (115 cm²)	Whole pad (230 cm²)
50 x 50 x 4.1 (concrete)	#3, #5	537	276	146
40 x 40 x 4.1 (concrete)	#3, #5	531	270	140
60 x 60 x 2.0 (ceramic)	#3, #5	531	270	140
80 x 40 x 2.0 (ceramic)	#3, #5	530	269	139

Load situations examined*

Load situation #1:	Dead weight Fg
Load situation #2:	Dead weight Fg + distributed net load qk category Z
Load situation #3:	Dead weight Fg + concentrated net load Qk category Z
Load situation #4:	Dead weight Fg + distributed net load qk category T2
Load situation #5:	Dead weight Fg + concentrated net load Qk category T2

* Source of the calculations: WSP Engineers, Würzburg

! Based on the studies and calculations of the WSP engineers, we recommend you adhere to the 'Required and calculated minimum compressive strength' from the tables above, especially at the edges and in the corners, or that here too you use whole pads as for the main area.

Insulating material manufacturers

Austrotherm Dämmstoffe GmbH, Hirtenweg 15, 19322 Wittenberge, Germany
www.austrotherm.de

JACKON Insulation GmbH, Carl-Benz-Straße 8, 33803 Steinhagen, Germany
www.jackon-insulation.com

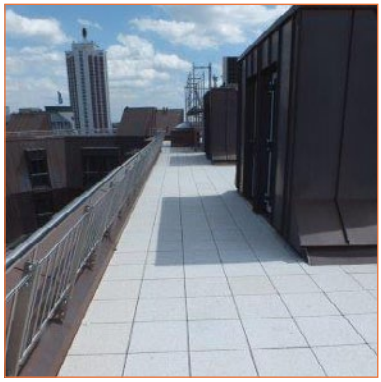
BASF SE Performance Materials, Carl-Bosch-Straße 38, 67056 Ludwigshafen, Germany
www.styrodur.de

Ursa Deutschland GmbH, Carl-Friedrich-Benz-Straße 46-48, 04509 Delitzsch, Germany
www.ursa.de

Deutsche Foamglas GmbH, Itterpark 1, 40724 Hilden , Germany
www.foamglas.de

LAYING PAVING SLABS IN GRAND STYLE

Retirement home, Burgbernheim
Roof terrace



Oelsnerhof, Leipzig – Roof terraces

Battle of the Nations Monument, Leipzig – Exhibition room

Out of sight and highly resilient: pedestal supports from Kaim in public buildings

KAIM – THE COMPANY

For more than 40 years, the Hans Kaim company has been firmly in family hands, standing with its name for extreme expertise in the field of paving slab pads, height-adjustable pedestal supports on balconies and terraces and for cross spacers in the garden and landscaping and tiling trades. Hans Kaim, after whom the company is named, transformed his business in 1977 from one supplying components to the toys industry into a firm with its own products. Since then the company's affairs have already been managed by three generations of the female side of the family: Hans Kaim's wife Veronika Kaim and daughter Magdalena Kraiß-Güdü (1979-2011) and now granddaughter Meryem Güdü (since 2012).

As specialists for paving slab pads, pedestals and cross spacers, Kaim has been making high-quality products for many years. All staff at the family business in Oberschwarzach, Germany also constantly work on improving this high standard still further. A particularly important element in this is dialogue with specialist retailers, users, planners and architects. In this way ideas and suggestions get incorporated from practitioners in the field and turned into new features and enhancements and specialist knowledge of products and their use gets passed on.

With expert, innovative product development, tested and certified (to DIN EN ISO 9001:2008) production processes and fast, reliable and timely service, Hans Kaim is the market leader for pedestal supports made of recycled plastic.

Our product range:

PLATTEN***FIX*** STANDARD-***PAD***

PLATTEN***FIX*** MAXI-***PAD***

MULTI-***PAD***

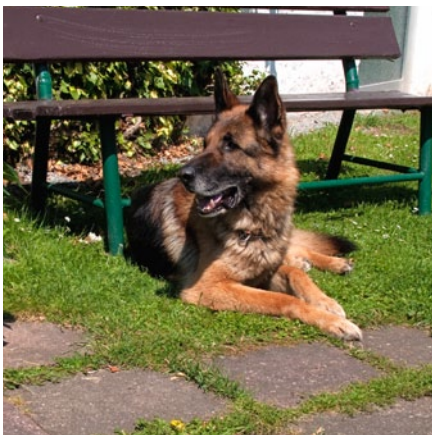
VARIO-***PAD*** 2

CROSS ***SPACERS***

GRASS CROSS ***SPACERS***

Our own ideas and great advice are Kaim's core competencies.






HANS KAIM GmbH
Schallfelder Weg 1 · 97516 Oberschwarzach · Germany
tel.: + 49 9382 99840 · fax: + 49 9382 99841
e-mail: info@plattenfix.de · www.plattenfix.de

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