

*The specialists for
paving slab pads
and cross joints*



A woman with long brown hair, wearing a dark blue t-shirt, is watering a lush garden. She is holding a green watering can with both hands, and water is spraying from the nozzle onto various plants, including yellow and orange flowers in the foreground. The background shows a white wall and more greenery. The image is overlaid with a large orange circle containing text, a white butterfly, a green leaf icon, and an orange butterfly in the bottom right corner.

*Environmental
protection
begins on your
patio*



Sustainability starts even with your choice of cross spacer. PLATTEN**FIX** opted for sustainable, environmentally friendly products long before climate change and recycling became social issues. In the 1980s, sealing of the ground surface played no role and many harmful side-effects of chemicals were not yet known.

That has fortunately now changed. What has remained the same are the standards that we set ourselves and the market-leading position of our support pads when it comes to sustainability.

Recycling: All PLATTEN**FIX** products are part of the recycling chain. Either they consist themselves of 100% recycled plastics, or they are made from materials that can be 100% recycled many times over.

No use of chemical interaction: All PLATTEN**FIX** products work purely mechanically - without any bonding agents, adhesives or other hazardous substances. No pollutants seep out, even over many years of use. And at the end of their life, pure materials are very much easier to recycle than products that have been stuck together.

No soil sealing:

PLATTEN**FIX** products enable water to flow away freely. Rain drops thus find their way back into the global water cycle.

All PLATTEN**FIX** products are packed in highly recyclable, environmentally friendly boxes and we largely refrain from using any plastic packaging.



**Allows water
to drain freely!**



*The specialists for
paving slab pads and
cross joints*

The company - HANS KAIM GmbH:

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 a family business we place great importance on a close working relationship with our employees, without whom the great success of PLATTEN**FIX** would not have been possible. At the same time this success shows that cost-efficiency and a corporate philosophy of caring for staff and the environment are not mutually exclusive, but rather that they complement each other extremely well.

As specialists for paving slab pads, pedestals and cross spacers, Kaim has been making PLATTEN**FIX** to a high level of quality 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 9001:2015) production processes and fast, reliable and timely service, HANS KAIM is the market leader for pedestal supports made of recycled plastic.

*Be it classic setts, quasi-natural grass joints or classy ceramic surfaces, be it with or without a slope, on an even sub-surface or with major differences in height, PLATTEN**FIX** has the perfect solution for your project.*

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STANDARD



MAXI



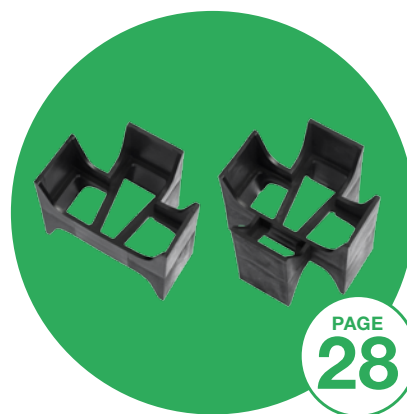
**MULTI
MULTI+PLUS**



**VARIO
VARIO MINI**



CROSS SPACERS



**GRASS CROSS
SPACERS**

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**Laying paving,
simply and inexpensively**



can be split

STANDARD

Simple, quick and inexpensive: PLATTEN**FIX** STANDARD pads can be quickly laid without any great prior experience of such work. As the four fields can be split, you can easily break off edge and corner pieces without the need for lots of tools. If you need to level out differing heights, simply use additional compensating shims. The slabs are laid dry – completely without any bed of grit.

Thus, with no great effort, you get an even, professional paved surface for balconies, terraces, pathways and even flat roofs.

As the paving slabs are raised and do not touch the ground at all, rainwater is able to drain off unhindered and no frost damage occurs in the winter. PLATTEN**FIX** pads are also incidentally made of 100-percent recycled soft PVC.



STANDARD

**Laying paving,
simply and inexpensively**



STANDARD-Pads have a support height of 10 mm and are available in joint widths of 4 and 6 mm. They can be supplied with a joint bar of 10 or 20 mm in height or with no joint bar. The inner labyrinth ensures good water drainage.

All STANDARD-Pads can be split into 2 halves or 4 corners. However, they are also available as edge pieces. To compensate for minor unevenness STANDARD-Shims are available in a height of 2.6 mm.

STANDARD (Can be split) Support: Ø 120 mm, 10 mm high, smooth bottom



(Joint bar details: width x height in mm)

4 x 20 mm

Prod. no. **123309**

Pack of 60



6 x 20 mm

Prod. no. **123408**

Pack of 60



4 x 10 mm

Prod. no. **123200**

Pack of 60



without joint bars

Prod. no. **123101**

Pack of 60

STANDARD edge piece (can be split) Support: Ø 120 mm, 10 mm high, smooth bottom



(Joint bar details: width x height in mm)

4 x 20 mm

Prod. no. **123316**

Pack of 60



6 x 20 mm

Prod. no. **123415**

Pack of 60



4 x 10 mm

Prod. no. **123217**

Pack of 60



without joint bars

Prod. no. **123118**

Pack of 60

STANDARD-Shim



Ø 120 mm,
2.6 mm high

Prod. no. **114444**

Pack of 60



Can be combined with



STANDARD
compensating shim,
thickness 2.6 mm

Advantages

- Simple, inexpensive pads for laying paving stones
- No connection with the surface below
- Dampen noise and resistant to load pressure
- Immediate dispersal of water – no puddles
- Compensating shim for minor differences in height
- Resistant to weathering
- Very durable
- Good air circulation underneath
- Quick access to liners, supply lines and cable ducts
- No rising due to freezing – no discarding of slabs
- Even pattern of joints
- Environmentally compatible
- Can be split into edge and/or corner pieces (under certain conditions, see p. 53)
- Made of 100% recycled soft PVC
- Ideal for balconies, terraces, paths and flat roofs
- Low weight load on roof surface, as no grit is needed
- Even support height prevents any wobbly slabs
- Damaged slabs can be replaced at any time



Material:

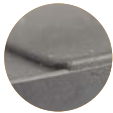
Polyvinyl chloride – soft PVC-P
(P = plasticised)

Gross density: 1.20 – 1.35 g/cm³

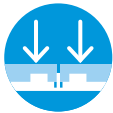
Resistant to deformation from -10 to +105°C

Fire class B2

Footfall sound insulation: $\Delta L_w = 11 \text{ dB}^1$



anti-slip bottom and rounded edges rule out any possibility of cutting into the liner



Load-bearing capacity*:

5,000 kg per quarter segment $\times 4 = 20,000 \text{ kg}$ per pad
(tested at 23°C and 50% relative air humidity)



Dimensions:

Ø 120 mm

Total area 113 cm² (area for the calculated thermal insulation pressure resistance 109 cm²)

Support: Height: 10 mm

Can be split

All pads are also available as edge pieces



Please note that when laying STANDARD pads on an existing liner, you must add a barrier made of weather- and UV-resistant PE sheeting or glass fibre matting with a total weight of at least 200 g/m².

What you need:

Slab format (cm)	Paving slab pad per m ²
20 x 120	8.33
25 x 25	16.00
30 x 30	11.11
30 x 60	5.55
30 x 120	5.55
40 x 40	6.25
40 x 60	4.16
40 x 80	3.13

Slab format (cm)	Paving slab pad per m ²
40 x 120	4.16
45 x 90	4.94
50 x 50	4.00
60 x 60	2.77
60 x 120	2.77
80 x 80	1.56
90 x 90	2.48



This way to the PLATTENFIX requirements calculator

Please note the laying information on pages 38 and 39.

All quantity details provided without warranty. As recommended by the manufacturer of your paving slabs, it is advisable to support them in the middle if their side length is 60 cm or more. This support was not taken into account in the required quantities calculation.

¹ For certified roof superstructure with no thermal insulation



**Minimum effort,
maximum result**



can be split
can be stacked

MAXI

The PLATTENFIX MAXI-Pads offer you all the advantages of the STANDARD-Pads, but can also be stacked to level out differences in sub-surface height. Please make sure when stacking that for all pads the joint width is identical.

Up to six stacked MAXI pads overcome a height difference of as much as 12 cm.

For finer degrees of unevenness, combine the MAXI pads with MAXI shims – in that way you can even out a further three millimetres. Laying is as easy as with STANDARD pads: At edges and in corners the PLATTENFIX pads can be easily split into half or quarter pads. Alternatively, for the corners you can opt to use a ready-made MAXI edge piece.



MAXI

**Minimum effort,
maximum result**



PLATTENFIX MAXI-Pads have a support height of 10 or 20 mm and are available in joint widths of 4 and 6 mm. They can be supplied with a joint bar of 10 or 20 mm in height or with no joint bar. The pads can be combined together and can also be stacked one on top the other. You just have to make sure here that all the pads have the identical the joint width. The inner labyrinth ensures good water drainage. All MAXI pads can be split into 2 halves or 4 corners. However, they are also available as separate edge pieces. To compensate for minor unevenness MAXI-Shims are available in a height of 3 mm.

MAXI (can be split and stacked)

Support: Ø 150 mm, smooth bottom

10 mm high



20 mm high



(Joint bar details: width x height in mm)

	Prod. no.		Prod. no.
4 x 20 mm	135319	4 x 20 mm	145318
6 x 20 mm	135418	6 x 20 mm	145417
4 x 10 mm	135210	4 x 10 mm	145219
6 x 10 mm	135517	6 x 10 mm	145516
0 mm	135111	0 mm	145110
Pack of 30		Pack of 30	

MAXI edge piece (can be split and stacked)

Support: Ø 150 mm, smooth bottom

10 mm high



20 mm high



(Joint bar details: width x height in mm)

	Prod. no.		Prod. no.
4 x 20 mm	135326	4 x 20 mm	145325
6 x 20 mm	135425	6 x 20 mm	145424
4 x 10 mm	135227	4 x 10 mm	145226
6 x 10 mm	135524	6 x 10 mm	145523
0 mm	135128	0 mm	145127
Pack of 30		Pack of 30	

MAXI-Pads of different thicknesses can also be combined together.

The recommended maximum height compensation that can be achieved is 12 cm (6 units).

MAXI-Shim



Ø 150 mm,
3 mm high

Prod. no. **134442**

Pack of 30



**Can be combined
with**



Can be combined with the MAXI-Shim, thickness 3 mm

MAXI Pads of different thicknesses can also be combined together. The recommended maximum height compensation is 12 cm (6 units).

Advantages

- Simple, inexpensive pads for laying paving stones
- Can be split into edge and/or corner pieces (under certain conditions, see p. 53)
- Can be stacked up to 6 high
- No connection with the surface below
- Dampen noise and resistant to load pressure
- Very durable
- Good air circulation underneath
- Quick access to liners, supply lines and cable ducts
- Compensating shims for minimal differences in height
- Resistant to weathering
- No rising due to freezing – no discarding of slabs
- Even pattern of joints
- Environmentally compatible
- Made of 100% recycled soft PVC
- Ideal for balconies, terraces, paths and flat roofs
- Low weight load on roof surface, as no grit is needed
- Even support height prevents any wobbly slabs
- Damaged slabs can be replaced at any time



Material:

Polyvinyl chloride – soft PVC-P (P = plasticised)

Gross density: 1.20 – 1.35 g/cm³

Resistant to deformation from -10 to +105°C

Fire class B2

Footfall sound insulation:

MAXI 10 / 4 x 10 mm $\Delta L_w = 11$ dB¹

MAXI 20 / 4 x 10 mm $\Delta L_w = 13$ dB¹



anti-slip bottom and rounded edges rule out any possibility of cutting into the liner



Dimensions:

Ø 150 mm, total area 176 cm² (area for the calculated thermal insulation pressure resistance 160 cm²)

Support: Height 10 mm or 20 mm

Can be split and stacked

All pads are also available as edge pieces



Note that when laying MAXI pads on an existing liner, you must add a barrier made of weather- and UV-resistant PE sheeting or glass fibre matting with a total weight of at least 200 g/m².



Load-bearing capacity*:

5,000 kg per quarter segment x 4 = 20,000 kg per pad (tested at 23°C and 50% relative air humidity)

What you need:

Slab format (cm)	Paving slab pad per m ²
20 x 120	8.33
25 x 25	16.00
30 x 30	11.11
30 x 60	5.55
30 x 120	5.55
40 x 40	6.25
40 x 60	4.16
40 x 80	3.13

Slab format (cm)	Paving slab pad per m ²
40 x 120	4.16
45 x 90	4.94
50 x 50	4.00
60 x 60	2.77
60 x 120	2.77
80 x 80	1.56
90 x 90	2.48



This way to the PLATTENFIX requirements calculator

Please note the laying information on pages 38 and 39.

All quantity details provided without warranty. As recommended by the manufacturer of your paving slabs, it is advisable to support them in the middle if their side length is 60 cm or more. This support was not taken into account in the required quantities calculation.

¹ For certified roof superstructure with no thermal insulation

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



**Ingenious pads
for slabs of every kind**



MULTI MULTI+PLUS

can be split
can be stacked
can be combined

Ideal for spacious, even surfaces: The two inexpensive PLATTENFIX slab support pads are extremely durable and easy to lay. For edges and corner areas they can easily be split into halves or quarters.

As they can be stacked up to seven high, they can even level out height differences of up to 24.5 centimetres with no problem.

You can also combine MULTI pads with VARIO pads in order to level out height differences more precisely still. Thanks to their large support area and great durability, MULTI pads are also ideal for use with ceramic slabs.



MULTI MULTI+PLUS

**Ingenious pads
for slabs of every kind**



**can be split
can be stacked**

The PLATTENFIX MULTI and MULTI+PLUS pads have slight ribbing to make them anti-slip and rounded outer edges. Both have joint bars 4 mm wide and 15 mm high. The difference between the two variants: MULTI is 15 mm high, MULTI+PLUS 35 mm high. Using a simple tool, both can be split in half or into quarters and can be stacked as a whole or in part pieces. And both can be combined with each other or with the VARIO pads and MAXI shim.

MULTI (can be split and stacked)

Support: Ø 180 mm, 15 mm high, ribbed bottom

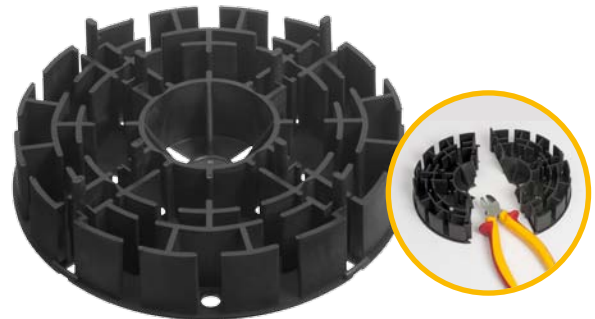


(Joint bar details: width x height in mm)

4 x 15 mm Prod. no. **193067** Pack of 32

MULTI+PLUS (can be split and stacked)

Support: Ø 180 mm, 35 mm high, ribbed bottom



(Joint bar details: width x height in mm)

4 x 15 mm Prod. no. **193074** Pack of 32



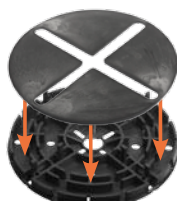
Can be combined with

Combination is possible with VARIO, VARIO MINI, MULTI and MULTI+PLUS, and with the MAXI shim.

A maximum of 7 MULTI or MULTI+PLUS pads can be stacked on top of each other or 6 MULTI / MULTI+PLUS pads with one of the two VARIO pads.



MULTI pads halved,
3x offset stacked



MULTI and MULTI+PLUS
with MAXI shims



MULTI with
MULTI+PLUS



MULTI+PLUS with
MULTI, VARIO and
reverse motion
locking



6 x MULTI+PLUS,
with VARIO and reverse
motion locking for max.
height compensation

Advantages

- Can be split (under certain conditions, see p. 53)
- Can be stacked
- Large support area
- To bridge big heights, MULTI and MULTI+PLUS can be combined with VARIO and the MAXI shim
- Environmentally compatible
- No connection with the surface below
- Very durable
- Good air circulation underneath
- Quick access to liners, supply lines and cable ducts
- Good water drainage
- Even pattern of joints
- No raised slabs due to ice
- You can stack up to a total of seven MULTI and/or MULTI+PLUS pads on top of each other
- Facilitate simple laying of slabs
- Ideal for laying ceramic slabs thanks to their low joint bars and large diameter
- Low weight load on roof surface, as no grit is needed
- Even support height prevents any wobbly slabs
- Damaged slabs can be replaced at any time



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

Fire class B2

Footfall sound insulation:

MULTI: $\Delta L_w = 16 \text{ dB}^1$, **MULTI+PLUS:** $\Delta L_w = 17 \text{ dB}^1$

anti-slip bottom and rounded edges rule out any possibility of cutting into the liner



Dimensions:

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

Can be split and stacked

MULTI, height 15 mm,

MULTI+PLUS, height 35 mm

Joint bar: Height 15 mm, width 4 mm



The slabs can be laid without any protective layers between waterproof seal and pedestal pads.



Load-bearing capacity*:

5,000 kg per quarter segment $\times 4 = 20,000 \text{ kg}$ per pad (tested at 23°C and 50% relative air humidity)

What you need:

Slab format (cm)	Paving slab pad per m ²
20 x 120	8.33
25 x 25	16.00
30 x 30	11.11
30 x 60	5.55
30 x 120	5.55
40 x 40	6.25
40 x 60	4.16
40 x 80	3.13

Slab format (cm)	Paving slab pad per m ²
40 x 120	4.16
45 x 90	4.94
50 x 50	4.00
60 x 60	2.77
60 x 120	2.77
80 x 80	1.56
90 x 90	2.48



This way to the PLATTENFIX requirements calculator

Please note the laying information on pages 38 and 40.

All quantity details provided without warranty. As recommended by the manufacturer of your paving slabs, it is advisable to support them in the middle if their side length is 60 cm or more. This support was not taken into account in the required quantities calculation.

¹ For certified roof superstructure with no thermal insulation

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



**Ideal for
evening out slopes**



VARIO VARIO MINI

can be split
can be combined

Wide areas, large paving slabs, major slopes: They are great demands – that our VARIO pads with their clever **PLATTENFIX** mechanism easily master.

By setting the tooth lock washers, the height can be seamlessly adjusted. Even retrospectively, if the slabs have already been laid.

Thanks to the enlarged support surface, the VARIO pads have great load-bearing capacity and are ideal for large slabs as well. The open joints prevent any damage to your paving from movement, rainwater is able to drain away unhindered and any frost damage is thus avoided. The VARIO pads can be split into two edge pieces or four fully-fledged corner pieces and can be combined with MULTI pads.



VARIO VARIO MINI

**Ideal for
evening out slopes**



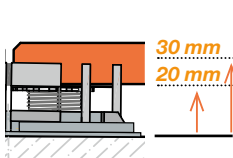
The VARIO and VARIO MINI PLATTENFIX pads have a robust, non-slip bottom, joint bars and adjustable tooth lock washers for seamless height adjustment from 20 mm to 30 mm (VARIO MINI) or from 35 mm to 50 mm (VARIO). Using the cross spacer (width of 4 or 6 mm possible) with reverse motion locking, which it is imperative you fit, you determine the joint width and prevent the cogwheels from any later rotating out of position. Note too that when laying at the edge or in running bond pattern you need a cross spacer with reverse motion locking for **each** half VARIO pad.

VARIO MINI (can be split)

Support: Ø 180 mm, 20-30 mm seamlessly height-adjustable. Joint bar: Height 55 mm, width 4 mm



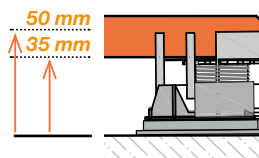
VARIO MINI
(20-30 mm) with
reverse motion locking



VARIO (can be split)

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

VARIO (35-50 mm)
with reverse motion
locking



(Joint bar details: width x height in mm)

4 x 55 mm Prod. no. **193166** Pack of 32

(Joint bar details: width x height in mm)

4 x 65 mm Prod. no. **192169** Pack of 32

CROSS SPACER with reverse motion locking:

for VARIO and VARIO MINI,
Total height: 60 mm. Length: 74 mm



(Joint bar details: width x height in mm)

4 x 15 mm Prod. no. **192145** Pack of 50
6 x 15 mm Prod. no. **192152** Pack of 32

**Essential
they are fitted!**



Advantages

- Evening out of slopes through seamless adjustment of height from 20-30 and 35-50 mm (min. starting height of 20 mm and max. end height of 50 mm)
- It is imperative that you fit a cross spacer with reverse motion locking - different joint widths can be selected (4 mm or 6 mm)
- Can be split (under certain conditions, see p. 53)
- Large support area and thus high load-bearing capacity
- Bridges big heights too through combination of MULTI and/or MULTI+PLUS and the MAXI shim
- Even pattern of joints
- Environmentally compatible
- Good drainage of water and no freezing over
- 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.
- Low weight load on roof surface, as no grit is needed
- Damaged slabs can be replaced at any time
- Very good air circulation underneath



Material:

Polyamide (PA 6), reinforced with 25% glass fibre (PA 6 GF25)
 Glass-fibre-reinforced, reusable, recyclable
 Gross density: 1.32 g/cm³
 Resistant to deformation from -40 to +130°C
 Fire class B2
 Footfall sound insulation:
 VARIO MINI $\Delta L_w = 20 \text{ dB}^1$, VARIO $\Delta L_w = 19 \text{ dB}^1$
 anti-slip bottom and rounded edges rule out any possibility of cutting into the liner



Load-bearing capacity*:

1) VARIO MINI

20mm cogwheel height = 5,000 kg per cogwheel $\times 4 = 20,000 \text{ kg / pad}$
 30mm cogwheel height = 1,200 kg per cogwheel $\times 4 = 4,800 \text{ kg / pad}$
 (Tested at 23°C and 50% relative air humidity)

2) VARIO

35mm cogwheel height = 1,900 kg per cogwheel $\times 4 = 7,600 \text{ kg / pad}$
 50mm cogwheel height = 1,300 kg per cogwheel $\times 4 = 5,200 \text{ kg / pad}$
 (Tested at 23°C and 50% relative air humidity)

The thermal insulation's required minimum compressive strength in the worst case scenario:

**e.g.: with 50 x 50 x 4.1 cm concrete slabs under the whole pad 146 kN/m²



Dimensions:

1) VARIO MINI

Ø 180 mm, total area 254 cm² (area for the calculated thermal insulation pressure resistance = 230 cm²)
 Seamlessly height-adjustable from 20 to 30 mm
 Four cogwheels individually adjustable in height, each Ø 65 mm, joint bar: Height 55 mm

2) VARIO

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 or 6 mm

Essential they are fitted!

By fitting the cross spacers with reverse motion locking, which it is imperative you do, you determine the joint width. Please note that when laying at the edge or in running bond pattern you need a cross spacer with reverse motion locking for **each** half VARIO pad.



The slabs can be laid without any protective layers between waterproof seal and pedestal pads.

What you need:

Slab format (cm)	Paving slab pad per m ²
20 x 120	8.33
25 x 25	16.00
30 x 30	11.11
30 x 60	5.55
30 x 120	5.55
40 x 40	6.25
40 x 60	4.16
40 x 80	3.13

Slab format (cm)	Paving slab pad per m ²
40 x 120	4.16
45 x 90	4.94
50 x 50	4.00
60 x 60	2.77
60 x 120	2.77
80 x 80	1.56
90 x 90	2.48



This way to the PLATTENFIX requirements calculator

Please note the laying information on pages 38 and 41.

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¹ For certified roof superstructure with no thermal insulation

* Tested by F+E Ing. GmbH – plastics laboratory on 24.06.2015**
 Calculated by WSP Ingenieure Würzburg on 31.07.2015

Strong team player!

**Ingenious pads
for combining**



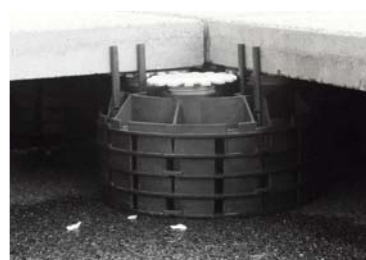
+



**In combination:
up to 26 cm
height compensation!**



**Bridging
great differences in height**





Combination options

Cross spacer reverse motion locking



Joint width 4 mm

or



Joint width 6 mm

Essential
they are fitted!



VARIO MINI



or



VARIO



MAXI-SHIM



or

or



10.5 cm

MULTI

Can be stacked
up to 7 high



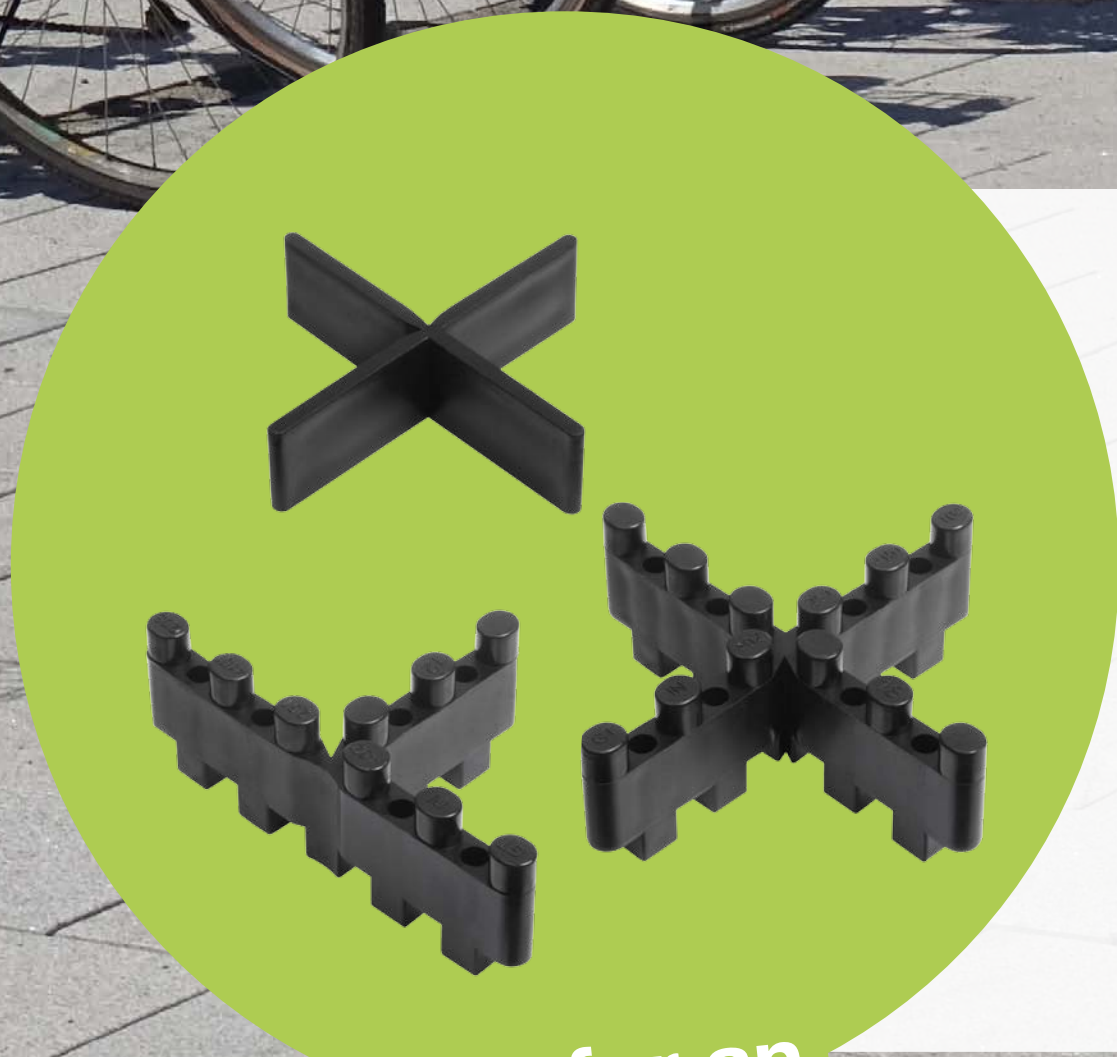
Up to 7 pads
can be combined
with each other



24.5 cm

MULTI+PLUS

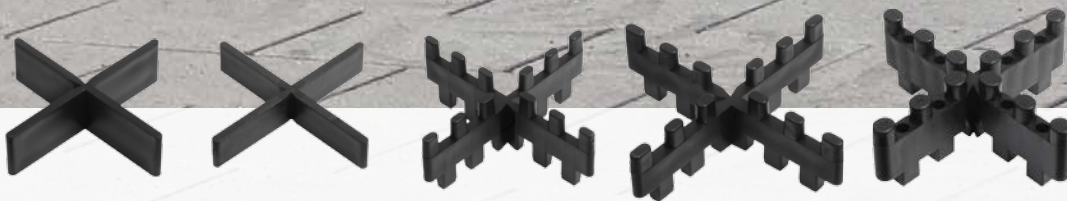
Can be stacked
up to 7 high



**The spacer for an
exact pattern of joints**



can be stacked
can be broken off

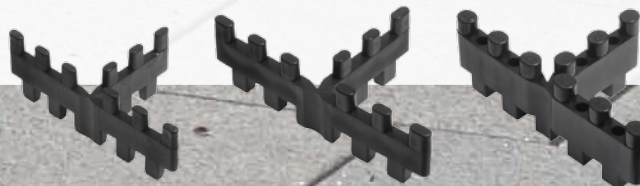


CROSS SPACERS

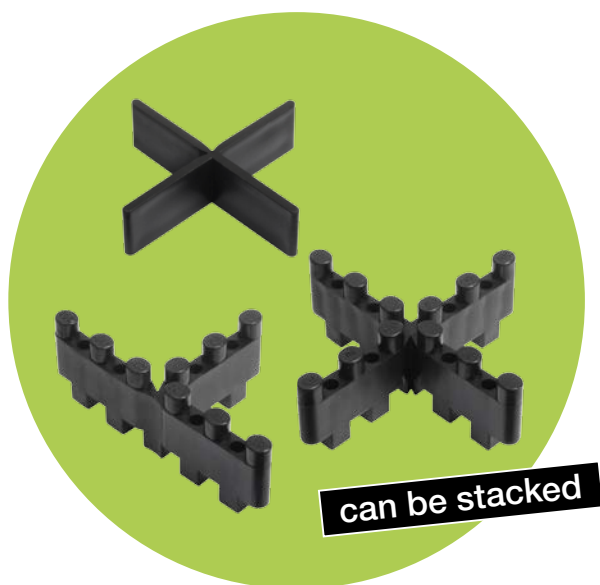
The classic format: ground cover design using setts or ceramic, concrete or stone paving slabs with joints spaced exactly evenly. In order to ensure on a grit bed that this laying technique is done neatly, CROSS SPACERS are essential.

PLATTEN**FIX** CROSS SPACERS keep the corners of your stones and slabs out of harm's way, reduce ground sealing and simultaneously divert rainwater into the soil. The environmentally compatible spacers made from recycled material are suitable for all slab sizes and materials. We even think about nature when it comes to the packaging: The CROSS SPACERS are packed in highly recyclable, environmentally friendly boxes and we largely refrain from using any plastic packaging.

Also available
as T-pieces!



CROSS SPACERS



**The spacer for
an exact pattern of joints**

Made of polypropylene, the PLATTENFIX CROSS SPACERS are ideal for laying slabs on a bed of grit. They guarantee an even pattern of joints and good drainage. Our serrated CROSS SPACERS in widths of 3, 4 and 6 mm grip particularly well.

CROSS SPACERS, *one wing can be broken off*



Cross spacer
60x3x10 mm (LxWxH)

Pack of	Prod. no.
1000	156413
250	156420
100	156437
1	156406



Cross spacer
60x3x15 mm (LxWxH)

Pack of	Prod. no.
1000	156314
250	156321
100	156338
1	156307

T-SHAPE SPACERS



T-shape spacer
60x3x20 mm (LxWxH)

Pack of	Prod. no.
1000	156611
250	156628
100	156635
1	156604



T-shape spacer
75x4x20 mm (LxWxH)

Pack of	Prod. no.
1000	152255
250	152248
100	152262
1	152200



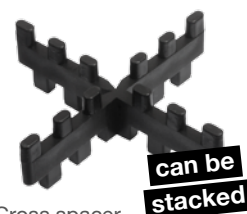
T-shape spacer
75x6x25 mm (LxWxH)

Pack of	Prod. no.
1000	151210
250	151227
100	151265
1	151203



Cross spacer
60x3x20 mm (LxWxH)

Pack of	Prod. no.
1000	156512
250	156529
100	156536
1	156505



Cross spacer
75x4x20 mm (LxWxH)

Pack of	Prod. no.
1000	152170
250	152163
100	152156
1	152101



Cross spacer
75x6x25 mm (LxWxH)

Pack of	Prod. no.
1000	151166
250	151173
100	151180
1	151104

Advantages

- Protect corners
- Let water through very well
- As the joints are open, rainwater is diverted off into the earth
- Reduces ground sealing
- Made of recycled material
- Environmentally compatible
- Resistant to weathering
- Even pattern of joints
- Suitable for all sorts of materials and slab sizes



Material:

Polypropylene (PP), recycled, reprocessed and environmentally compatible

Gross density: 0.895 – 0.92 g/cm³

Resistant to deformation from -10 to +110°C

Minimal water absorption

Fire class B2



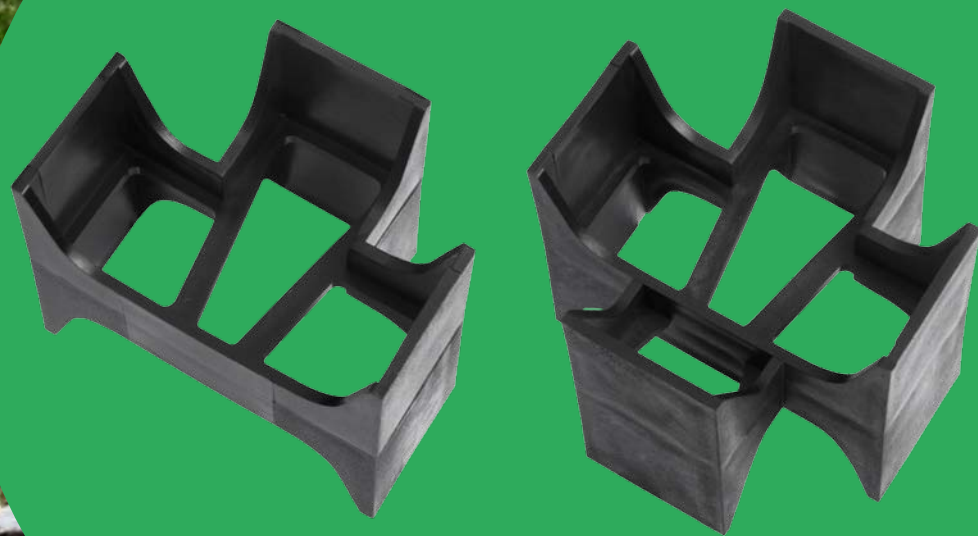
What you need:

Slab format (cm)	CROSS SPACERS per m²
20 x 120	8.33
25 x 25	16.00
30 x 30	11.11
30 x 60	5.55
30 x 120	5.55
40 x 40	6.25
40 x 60	4.16
40 x 80	3.13

Slab format (cm)	CROSS SPACERS per m²
40 x 120	4.16
45 x 90	4.94
50 x 50	4.00
60 x 60	2.77
60 x 120	2.77
80 x 80	1.56
90 x 90	2.48



**This way to the PLATTENFIX
requirements calculator**



**An intermediate world
between grass and stone**



GRASS CROSS SPACERS

Want to create a garden or courtyard surface in a way that is close to nature, kind to the environment and avoids any sealing over of the ground? Then GRASS CROSS SPACERS are the number one choice for you.

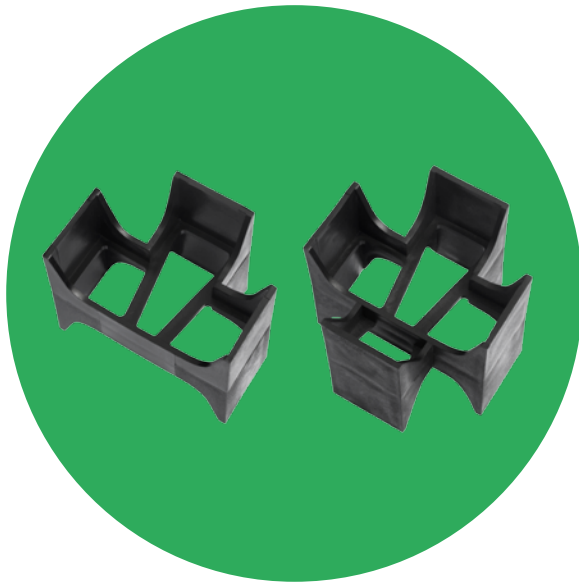
Three centimetres wide, they give grass and plants sufficient living space to grow between the laid slabs.

That not only looks attractive, it also helps water to drain. And by combining cross and T-shape spacers, numerous laying patterns are possible – stack bond, running bond, a combination of different stone sizes: all no problem.



GRASS CROSS SPACERS

**An intermediate world
between grass and stone**



The PLATTEN**FIX** GRASS CROSS-SPACERS and T-SHAPE SPACERS can be used for laying setts with grass, silica sand or fine stone chipping joints (chippings not bigger than 4 mm) in a customary crushed stone bed in stack bond or running bond pattern. GRASS CROSS SPACERS are used primarily for courtyard areas and terraces, on pathways, drives and in the construction of parking spaces for cars. Their use prevents any sealing over of the ground. The GRASS CROSS SPACERS are internally reinforced with cross-members so that they do not get pushed together. Depending on the sub-surface, using GRASS CROSS SPACERS enables you to configure the joints in different ways – with coarse silica sand (grain size 2-4 mm), bedding grit (grain size 4 mm), grass or ground cover suitable to walk on.



GRASS CROSS SPACER

70x30x55 mm (LxWxH)

Prod. no. **175117** Pack of 250

Prod. no. **175100** Pack of 1



T-SHAPE GRASS SPACER

70x30x55 mm (LxWxH)

Prod. no. **175223** Pack of 250

Prod. no. **175209** Pack of 1



NOTE: When being used on courtyard areas or garage drives subsequently to be driven on by cars, the GRASS CROSS SPACERS must additionally be stabilised using water-permeable single grain mortar (at least 10 mm deep), e.g. from Schomburg or PCI Pavifix. The company carrying out the work must check whether the sub-surface and the structure of the paving are suitable for vehicular use.

After the setts are laid, the area should be compacted before the joints are filled in, as otherwise the cross spacers will get pushed back up and become visible.

Advantages

- Permanent green spaces
- Let water through very well
- As the joints are open, rainwater is diverted off into the earth
- Reduces ground sealing
- Made of recycled material
- Environmentally compatible
- Resistant to weathering
- Even pattern of joints



Material:

Polypropylene (PP), recycled, reprocessed and environmentally compatible

Gross density: 0.895 – 0.92 g/cm³

Resistant to deformation from -10 to +110°C

Minimal water absorption

Fire class B2



Dimensions:

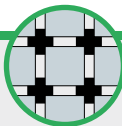
Grass cross spacer

(length x width x height in mm) 70x30x55 mm

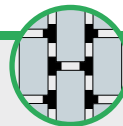
Grass T-shape spacer

(length x width x height in mm) 70x30x55 mm

What you need:



Laying in the
stack bond pattern

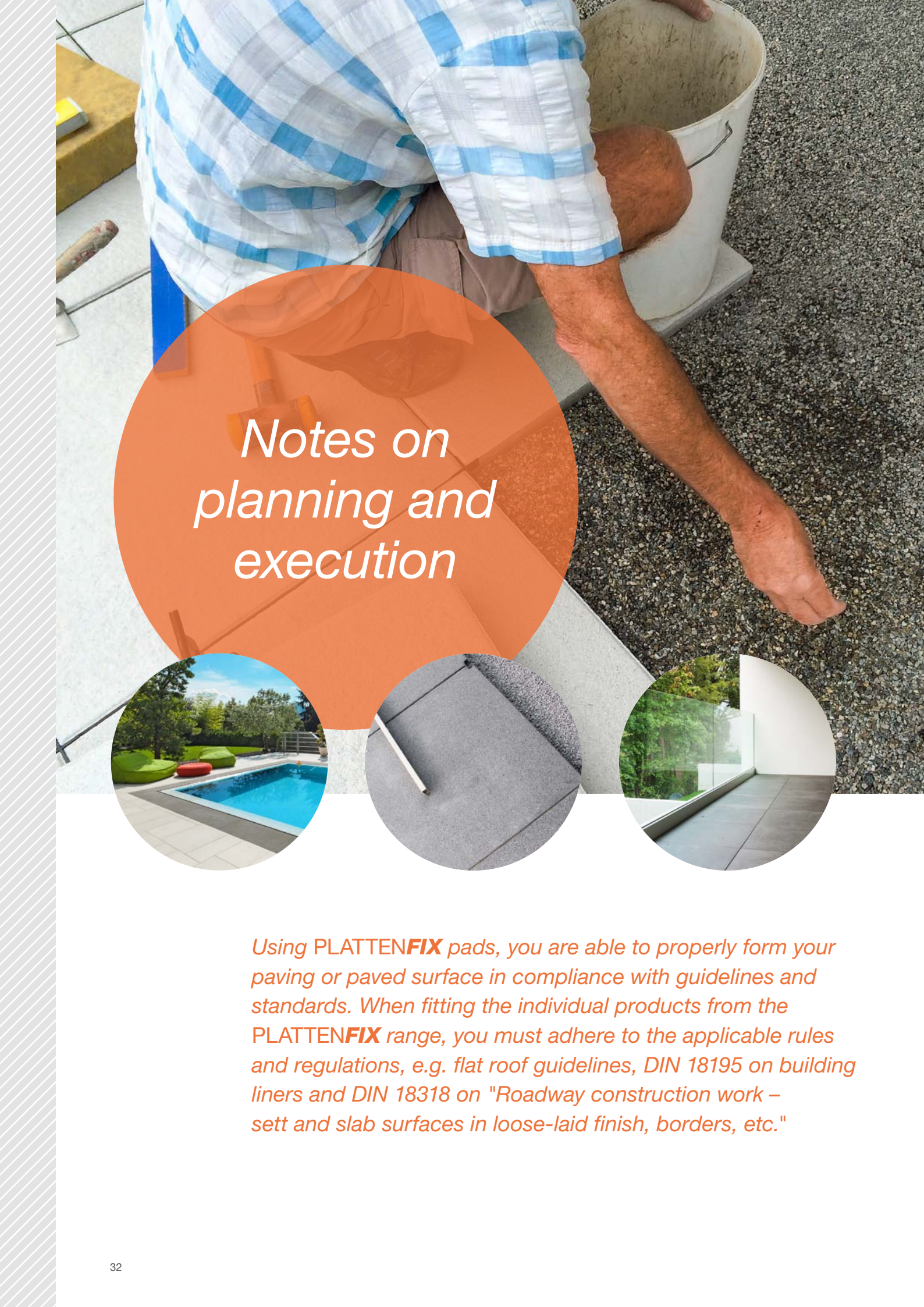


Laying in the
running bond pattern

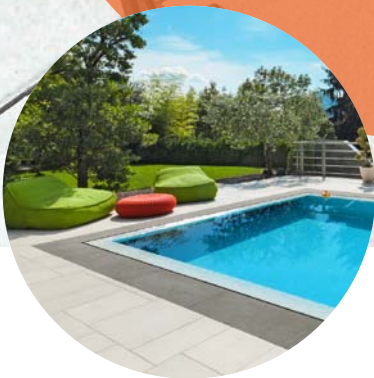
Sett format (cm)	Cross spacers per m ²	T-shape spacers per m ²
10 x 10	59	118
9 x 12	55	110
8 x 16	48	96
12 x 12	44	88
12 x 16	35	70
14 x 14	35	70
10 x 20	33	67
12 x 18	31	63
16 x 16	28	55
14 x 21	25	49
16 x 24	20	39
20 x 20	19	38
18 x 24	18	35
15 x 30	17	34
24 x 32	11	21
30 x 30	9	18

**This way to the PLATTENFIX
requirements calculator**





Notes on planning and execution



*Using PLATTEN**FIX** pads, you are able to properly form your paving or paved surface in compliance with guidelines and standards. When fitting the individual products from the PLATTEN**FIX** range, you must adhere to the applicable rules and regulations, e.g. flat roof guidelines, DIN 18195 on building liners and DIN 18318 on "Roadway construction work – sett and slab surfaces in loose-laid finish, borders, etc."*

As for paved surfaces on pedestals with open joints the surface underneath has to be very stable, the only insulating material that DIN EN 1991-1 allows you to choose here as thermal insulation is an appropriate, very durable material (XPS or of comparable or higher quality), as the insulating material has to absorb the downward loads that the concrete slab would otherwise absorb.

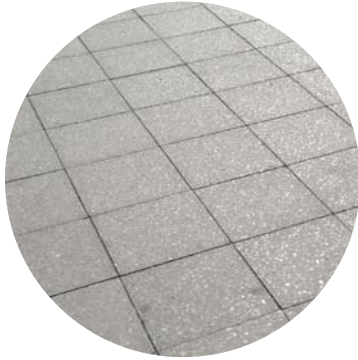
- Roof waterproofing seals overlaid with slabs made of non-flammable materials fulfil the specifications for 'hard roofing' required by the guidelines.
- When using STANDARD or MAXI pads, there must be an appropriate separating layer on the liner underneath the paved covering. Observe the manufacturers' instructions in relation to the sealing membranes and paving slab pads. With MULTI and VARIO pads no protective layer has to be laid on the liner.
- When laying terrace slabs in a grit bed on flat roofs, you must adequately protect the roof surface seal/liner (bitumen or plastic; already in place or yet to be created) against physical damage by using a protective layer compliant with flat roof guidelines. The following can, for example, be used as protective layers:
 - Plastic membrane, at least 300 g/m²
 - Sheets of semi-rigid PVC, at least 1.0 mm thick
 - Sheets of PVC-P, at least 1.2 mm thick
 - Building protection mats made of rubber granules, at least 6.0 mm thick
 - Building protection mats made of plastic granules, at least 4.0 mm thick
 - Drainage mats or slabs
- 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.
- 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 order to avoid any frost damage or freezing over, paved coverings should be laid on balconies, terraces and flat roofs with open joints of different widths, preferably 4 to 6 mm, thus ensuring that surface water gets guided away 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.
- Where the paving is to be laid loose, the ground surface must be load-bearing and firm. It must have been correctly profiled, be even and be at the required height.
- The ground must be adequately drained.
- The drop must be made at least 2.5% and in the case of soil susceptible to water at least 4%.
- The base course of loose stone aggregate must be load-bearing, resistant to going out of shape and adequately permeable for water. A compact, constantly filtering top surface is absolutely essential.
- Adequately stable edging must be built in, compliant with the regulations.
- After laying the setts, the surface must be grouted using a constantly filtering mix of minerals and at the end of this process, where necessary, compacted.



Important note: Our 'Notes on planning and execution' are only a general recommendation. The individual circumstances on site must always be examined separately and can therefore not be taken into account in this generally applicable recommendation. All statements made remain non-binding.

Diverse types of laying

*From the classic stack bond layout to creative diagonal patterns:
with PLATTENFIX pads you can design your surfaces exactly as you wish!*



Stack bond

Laying slabs in the stack bond pattern is the most used form of laying. It can be run straight up against a wall or diagonally.

Laying using whole pads or cross-spacers



Running bond

A classic pattern, one of the most common styles of laying, very stable, easy to lay.

Laying with edge pieces / half pads or T-shape spacers



Stretcher bond or linear laying pattern

Strict division of the surface area, graphical effect created by clear joint pattern, low bonding effect.

Laying with edge pieces / half pads or T-shape spacers



Roman bond

A Roman bond is flagstone pattern in which a constantly recurring modular laying pattern is achieved using slabs or natural stone formats of varying sizes.

Laying with edge pieces / half pads or T-shape spacers



Herringbone/ elbow bond

Vibrant visual picture, focussed on structure, very stable, as the blocks, offset by 45 degrees, have a very firm bond.

Laying with edge pieces / half pads or T-shape spacers



Diagonal bond

Laid at an angle of 45 degrees to the pathway axis and like the herringbone pattern features a very high level of stability.

Laying with edge pieces / half pads or T-shape spacers and whole pads and cross-spacers mixed together



**This way to the PLATTENFIX
requirements calculator**

In order to work out the number of paving slabs and pads, please use our calculator programme on our website:

www.plattenfix.de/bedarfsrechner

Laying slabs by plan



Laying guidelines

Good planning is half the laying job done

Anyone wanting to create a bespoke paved area, should plan and carefully check things out in advance – on the following pages we are happy to help you with that.



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
- 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 52 and 53.
- When laying paving slabs or setts with cross-spacers or grass cross-spacers on a bed of grit, you must ensure that the sub-surface has been properly built up. Here too work must be done in compliance with the applicable regulations.



When fitting all PLATTENFIX products, it is essential that the surface is held by stable fixing at the edges in order to provide a firm hold all the way around.





All junctions (with walls/doors etc.) must be permanently protected from damage. It must also 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.

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



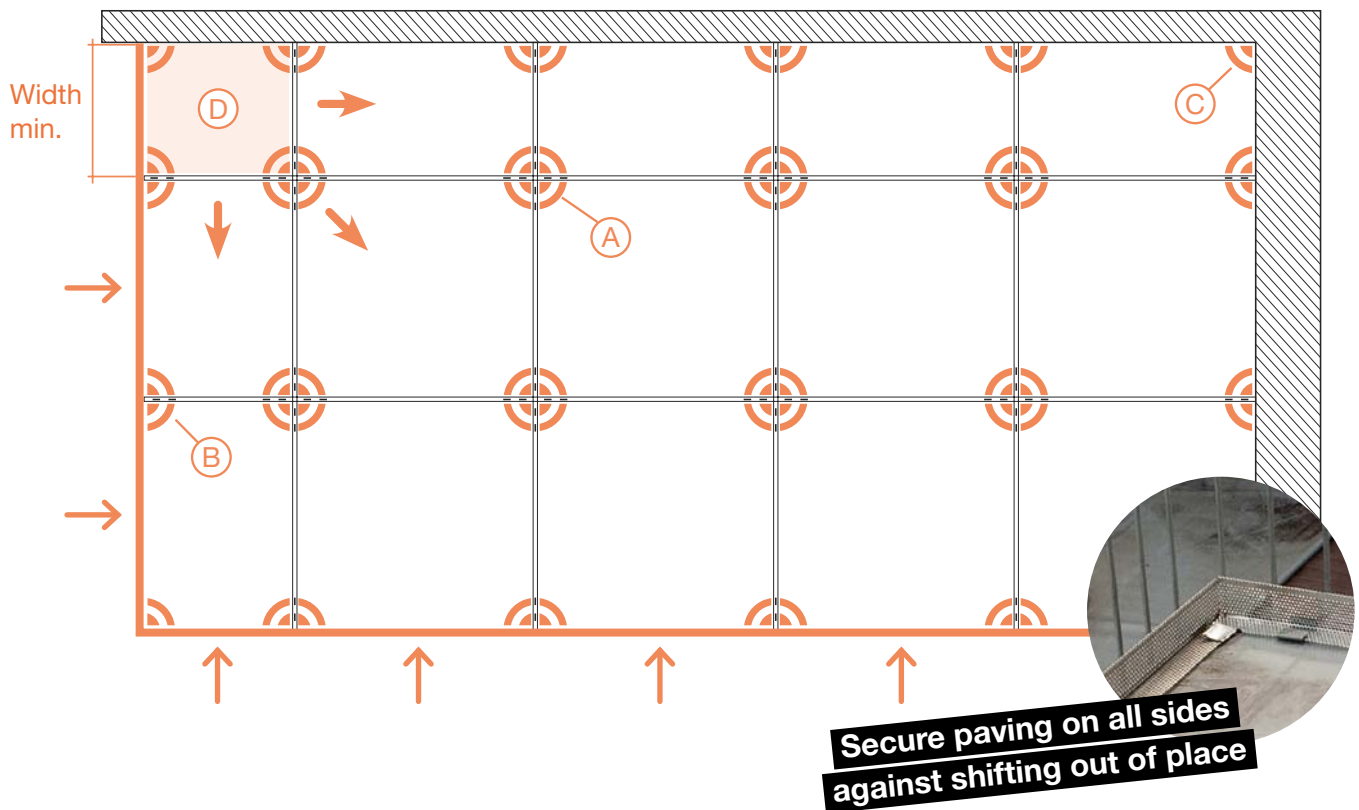
Vertical load capacity (Load capacities as per DIN EN 1991-1-1/NA)

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

Laying instructions

Apply for all PLATTENFIX pads



Laying slabs using PLATTENFIX pads is always done following the same principle, which we show you on this page. On the following pages we then respectively look at the different PLATTENFIX pads.

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 shims.

You should then look for a crossways and lengthways side in order to establish a right angle for starting to lay the slabs. We recommend utilising two outer edges (eaves/parapets or similar) in order to begin laying whole slabs, extending out from those edges, out of the corner 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)** half pads are fitted so that here too the slabs are lying on a quarter piece. **(C)** Quarter pieces are laid in the corners.

By the way: the STANDARD and MAXI pads can be easily cut in half or into quarters using a craft knife. For VARIO and MULTI pads use wire cutters. For large-format slabs that have to be centrally supported, you can fit STANDARD and MAXI with no joint bar.

(D) The area to be paved should be divided up in such a way that no slab that gets cut to size...

STANDARD: is smaller than 13 cm

MAXI: is smaller than 16 cm

MULTI / MULTI+PLUS: is smaller than 19 cm

VARIO / VARIO MINI: is smaller than 19 cm.



STANDARD



MAXI

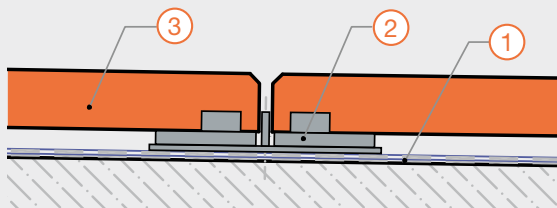


Slab lifter
Straight-edge
Spirit level
Cutter

required tools

Components

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



- ① A protective layer
- ② The STANDARD-Pads, potentially in combination with the STANDARD-Shims or MAXI-Pads, potentially in combination with the MAXI-Shim
- ③ The paving

When using STANDARD or MAXI pads it is **essential that a protective layer** made of at least 200 g/m² weather- and UV-resistant PE sheeting or glass fibre matting is laid on top of the liner/seal.



Split a pad into corner pieces ...



... and lay this truly aligned ...



... in three corners.

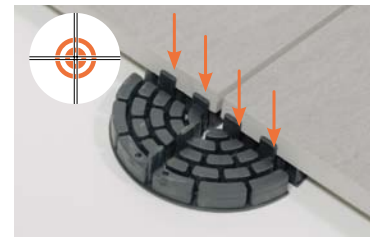


Then lay the edge slabs on the half pads. The remaining slabs are laid from the corner outwards.

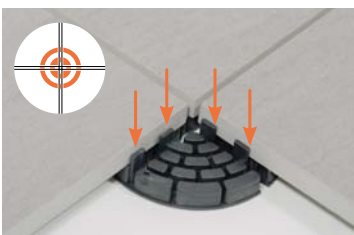


**Stacking
(up to 6 high) possible
with MAXI only!**

If you stack half MAXI pads on the outer edge of your area, turn the individual pads by half a rotation, i.e. offset by 180 degrees.



Always lay your slabs with one corner on a quarter piece of a slab pad.



Please use the EIGHT joint bars on the pad as aids for butting up the paving slabs and also as cross spacers, so that ...



... the slabs are always laid at right angles and truly aligned. This gives you a stable surface and an even pattern of joints.



You can retrospectively take up or replace individual slabs at any time.



MULTI / MULTI+PLUS

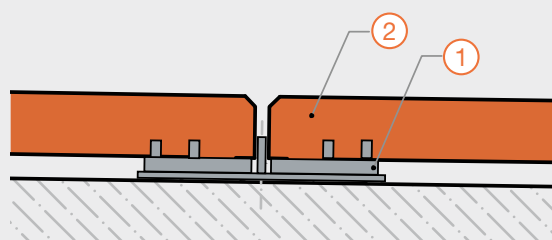


Slab lifter
Straight-edge
Spirit level
Wire cutters

required tools

Components

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



- ① MULTI or MULTI+PLUS on their own or in combination
- ② The paving

With the MULTI pads **no separating layer** has to be laid on the liner/seal.



Split a pad into corner pieces, which ...



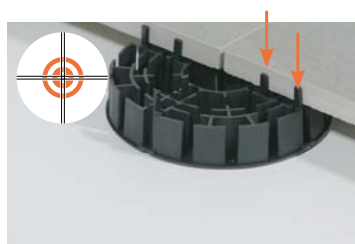
... you lay truly aligned in three corners.



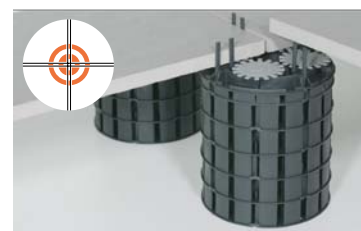
Then lay the edge slabs on the half pads.



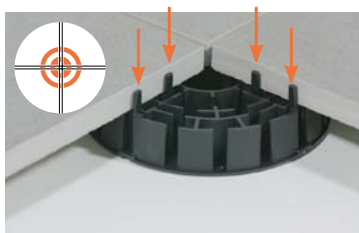
If you stack half pads on the outer edge of your area, turn the individual pads by half a rotation, i.e. offset by 180 degrees.



Always lay your slabs with one corner on a quarter piece of a slab pad.



For even smaller increments, simply combine the stacked MULTI pads with our VARIO pads.



Please use the EIGHT joint bars on the pad as aids for butting up the paving slabs and also as cross spacers, so that ...



... the slabs are always laid at right angles and truly aligned. This gives you a stable surface and an even pattern of joints.



You can retrospectively take up or replace individual slabs at any time.



VARIO / VARIO MINI

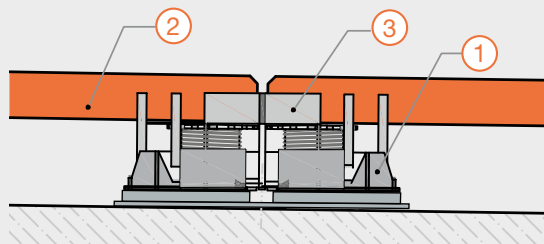


Slab lifter
Straight-edge
Small hammer
Wire cutters
Piece of wood,
3 mm thick
Spirit level

required tools

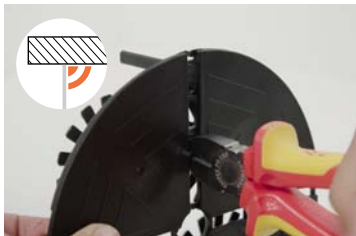
Components

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



- ① VARIO, potentially in combination with MULTI and/or MULTI+PLUS
- ② The paving
- ③ and, finally, the cross spacers with reverse motion locking

With the VARIO pads **no separating layer** has to be laid on the liner/seal.



Split a pad into corner pieces and ...



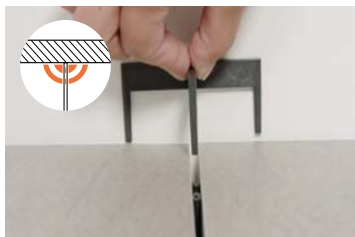
... lay them truly aligned in three corners.



The reverse motion lock's wing, which is designed to be broken off, prevents any later incorrect positioning of the adjusting wheels.



Then lay the edge slabs on the half pads.



In the joint that has been created prevent two cogwheels from rotating out of position using the reverse motion lock.



Always lay your slabs with one corner on a quarter piece of a slab pad.



Using a filler wire, you can turn the cogwheels to finely adjust the slab height. As the cogwheels project up into the joints, you can even adjust the height after the slabs have been laid.

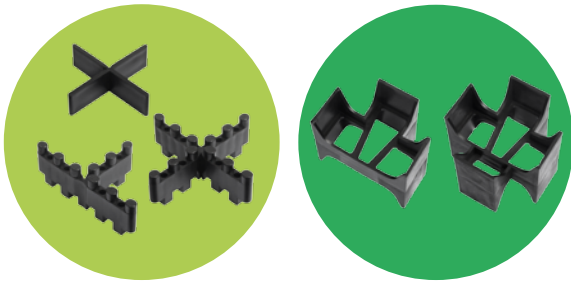


Essential they are fitted!

As soon as each quarter has a slab laid on it, insert the cross-spacer into the joint from above as a reverse motion lock.

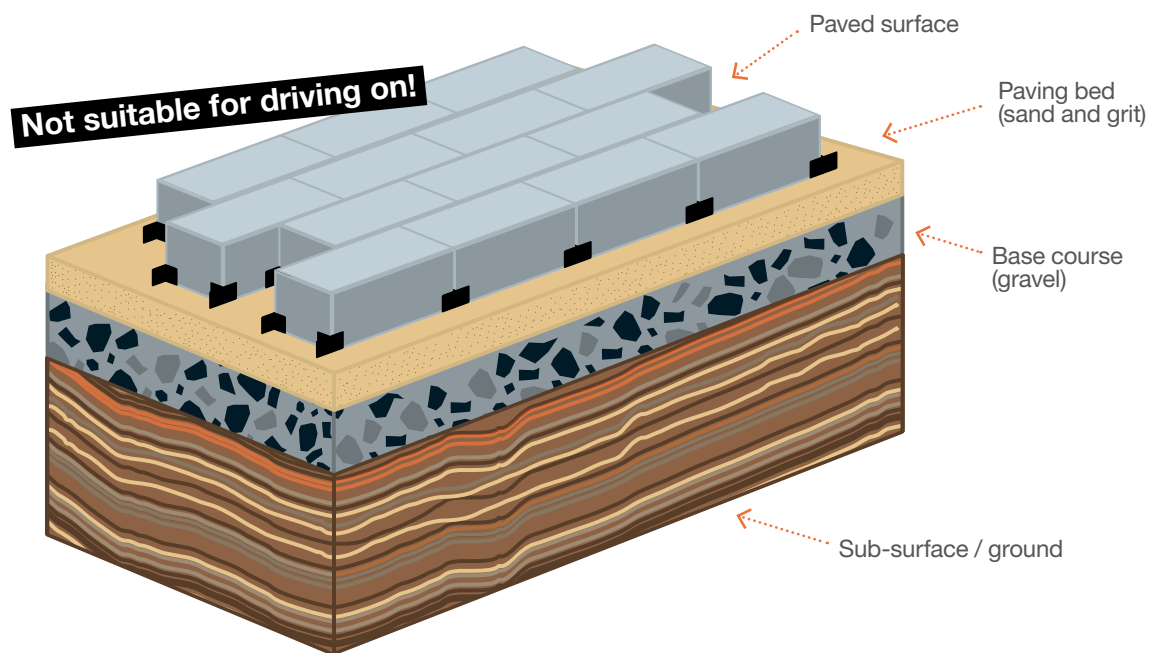


As the slabs are laid together tightly, you can use a 3-mm thick piece of wood and a small hammer as an extra aid for fitting the cross-spacers.



Laying instructions for cross-spacers and grass cross-spacers

1. Grit bed set-up for cross-spacers and grass cross-spacers



- Excavation of the area from c. 40 cm depth
- Setting the edging
- Build in mineral mix (base course) made up of 10 – 15 cm gravel, pebble size 10 – 45 mm
- Using a vibrator plate, compact layer by layer
- On top of the base course comes the paving bed of grit and sand
- Using a wood/metal bar, smooth down the fine grit layer (building in a drop!)
- Lay paving in the desired pattern
- Brush crushed stone fines or similar into the joints
- Compact again and brush-fill joints anew



When being used on courtyards and garage drives subsequently to be driven on by cars, the cross-spacers / grass cross-spacers must additionally be stabilised using water-permeable single grain mortar (e.g. from Schomburg, PCI Pavifix or other suppliers).

After the setts are laid, the area should be compacted before the joints are filled in, as otherwise the CROSS SPACERS will get pushed back up and become visible.

- Gauge the maximum height of the top edge of the setts or paving slab surface in order to determine the height of the grit bed
- Decide on product
- Working out from a fixed corner (right angle), start laying
- In the corner you lay corner pieces and on the edge T-shape pieces
- The slabs/setts must lie tightly up against the cross-spacers with no air gap.



Slab lifter

Straight-edge

Spirit level

Rubber hammer

2. Laying cross-spacers in the stack bond pattern



When laying the first corner of the paving, you insert the cross spacer into the joint. The slabs have to be laid really tightly up against the edges and each other. The slabs must also be laid without any surface air gaps and with only the prescribed CROSS SPACERS as spacing. Using kerb stones or similar as edge fixing is essential.

3. Laying T-shape spacers in the running bond pattern



Where laying in a running bond pattern, you can split the cross-spacer at the intended break point and fit the T-shape piece thus created or order ready-made T-shape spacers from the factory. Depending on the height of the slabs to be laid, you can stack the cross-spacers on top of each other.



Example of running bond

If you always pay attention to joint bars closely abutting, you will get a clean joint pattern and a stable surface. No frost damage occurs, nor does any efflorescence appear on the paving. That's because there are no mortar joints to release any cement or calcium carbonate.

4. Laying grass cross-spacers



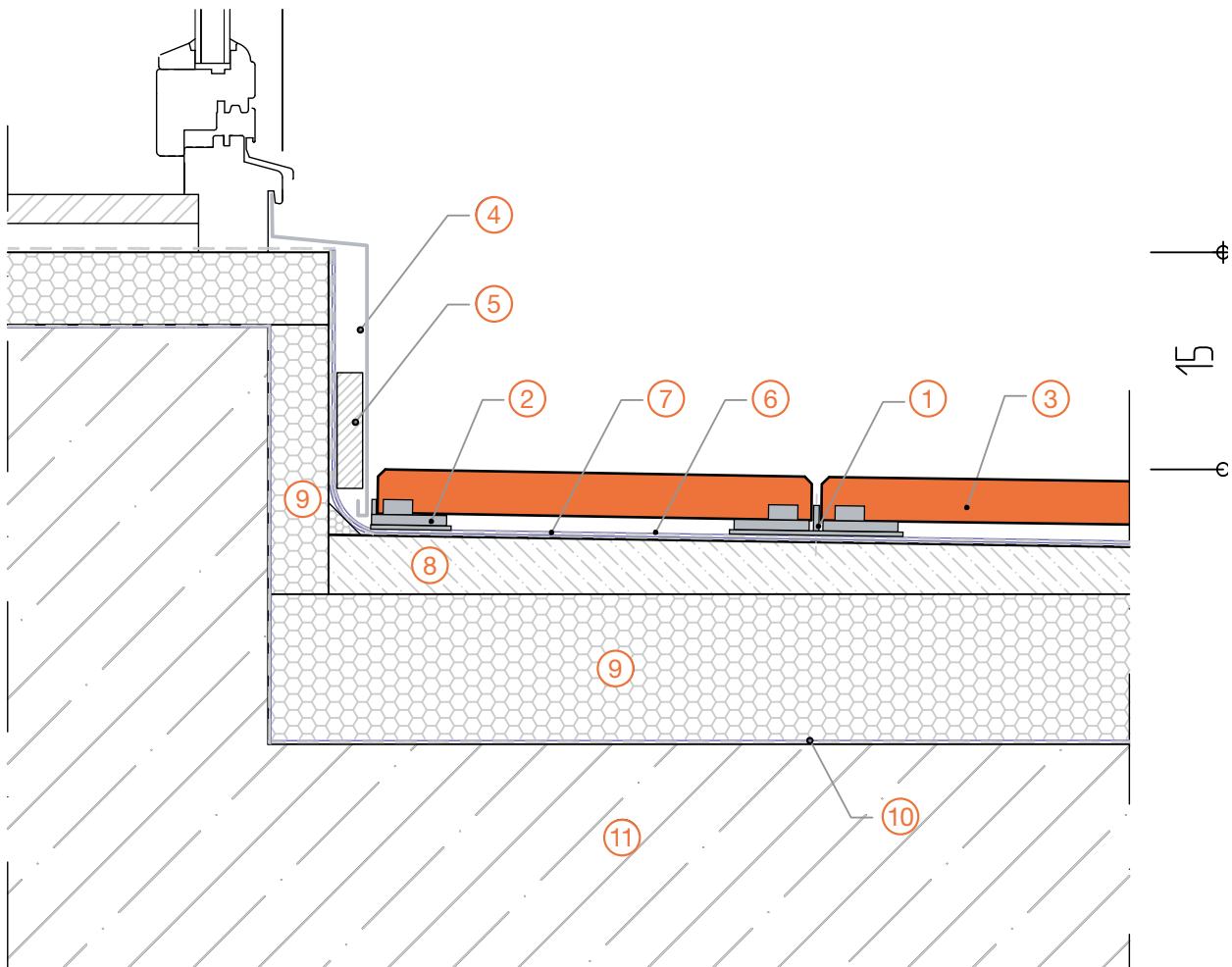
Example of laying setts in stack bondpattern using GRASS CROSS SPACERS

Examples of use

.....>

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)



Material:

- ① STANDARD or MAXI
- ② STANDARD / MAXI edge piece
- 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)



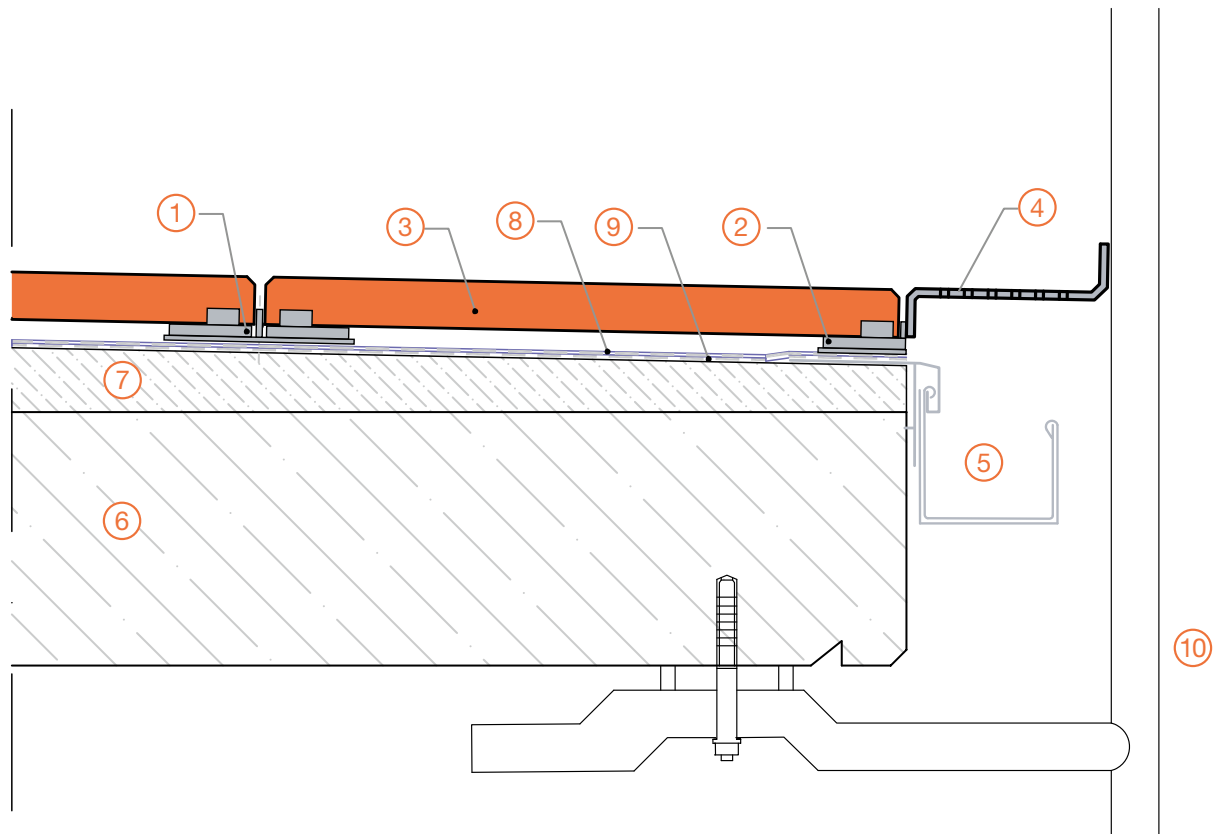
Note:

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 'Basics for measurements' section on page 50)!

Edge finished with metal end plate on reinforced concrete balcony slab

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



Material:



- ① STANDARD pad
- ② STANDARD edge piece
- 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

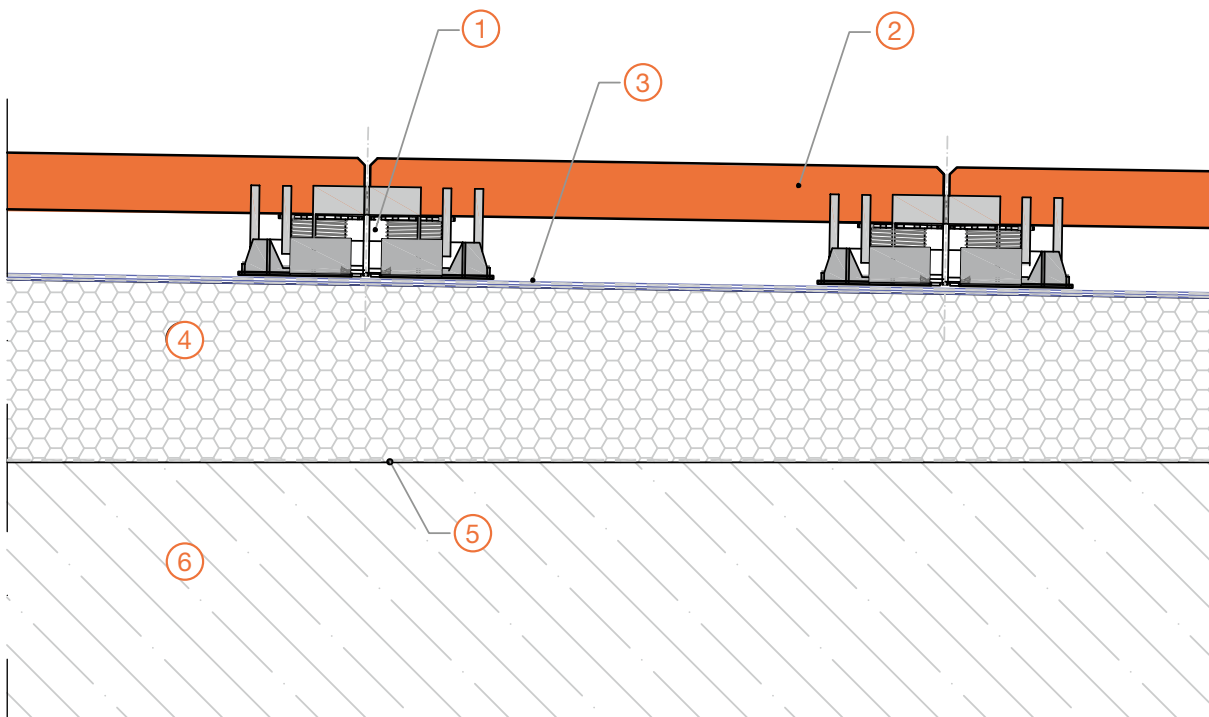
Note:

When using STANDARD-Pads, 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 50)!

Paving on VARIO-Pad supports on non-insulated roof with tapered insulation

Suggested laying procedure



Material:



- ① VARIO pad, 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)

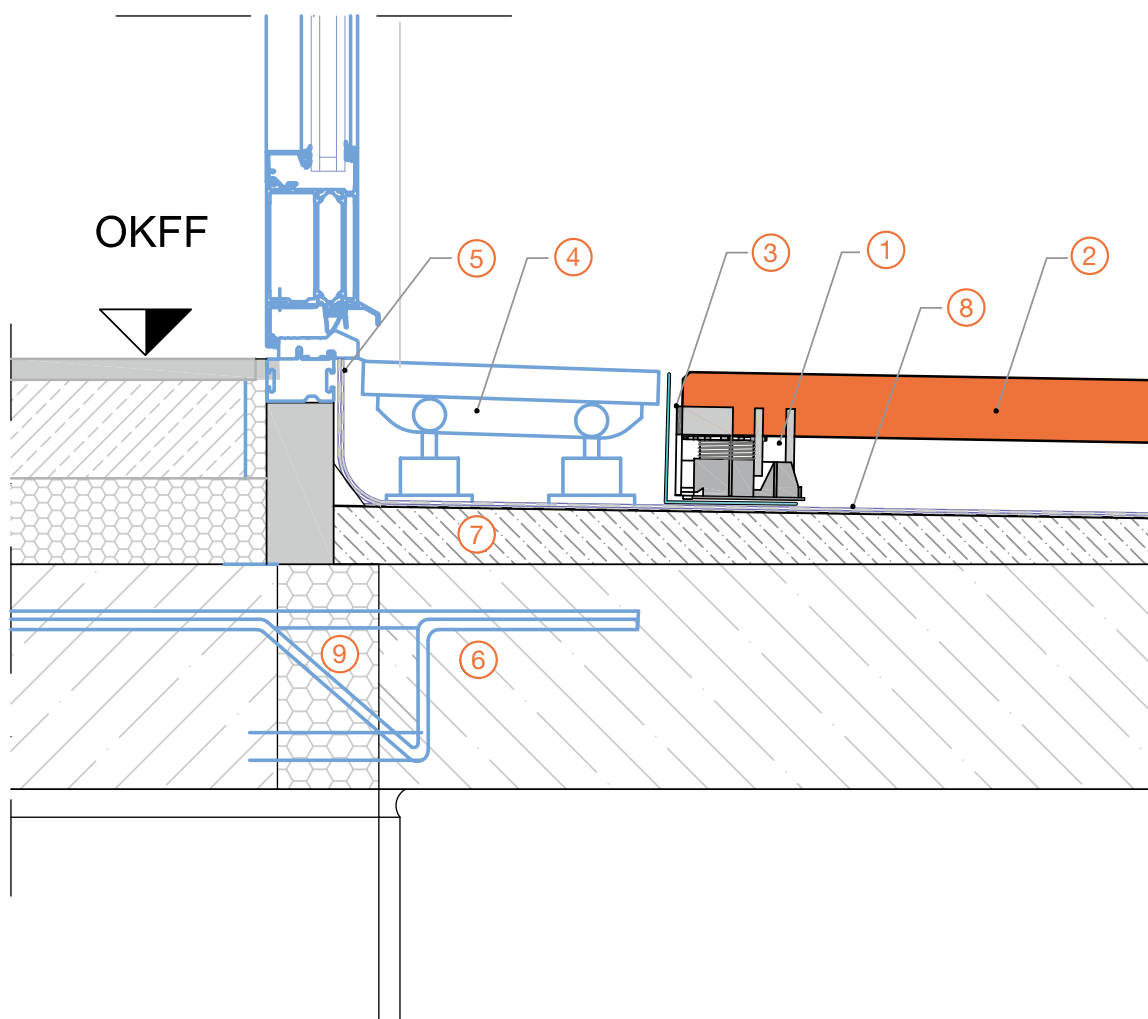
Note:

When using slab support pads made of polyamide with an element of glass fibre content, such as the VARIO, VARIO MINI, MULTI, MULTI+PLUS pads, no separating or protective layer is required on top of the waterproof seals.

Please note the table on the pressure resistance of the calculated XPS insulation materials (see 'Basis for measurements' section on page 50)!

Patio door junction – wheelchair accessible with drain gulley

Non-binding example for creating a wheelchair-accessible crossover to a terrace door (see ⑤)



Material:

- ① VARIO pads, height adjustable (half pads)
- ② Paving, self-supporting
- ③ Edging corner profile, perforated (for drainage), reinforced (stuck on in a line)
- ④ Drain gulley, height-adjustable, with grate
- ⑤ Junction with terrace door, consisting of sealing membrane and protective metal plate
- ⑥ Reinforced concrete, as per DIN 1991-1 (formerly DIN 1055-3)
- ⑦ Sloped screed with a slope of at least 2% per metre 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, VARIO MINI, MULTI, MULTI+PLUS pads, no separating or protective layer is required on top of the waterproof seals.

As per DIN 18195-5 and the 'Flat Roof Guidelines', wheelchair accessible crossovers 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 50)!



The MULTI pads fix your slabs in place exactly at the height of the drain gully.



Clean and professional: the junctions



Basis for measurements Stability under high pressure

*Sources for the bases
on which to assess the
appropriate XPS / cellu-
lar 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

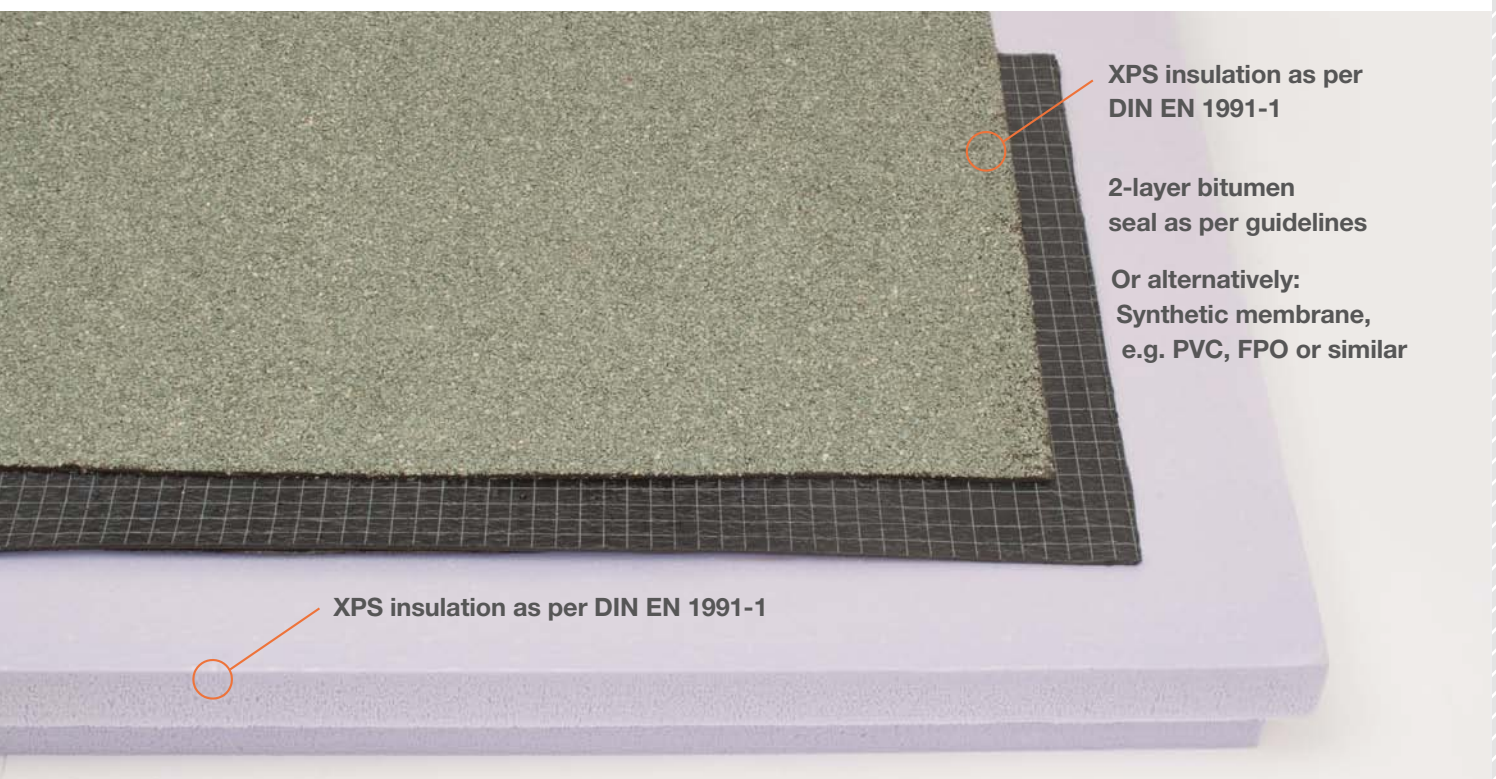
The thermal insulation to be fitted must be thoroughly checked in advance for its intended purpose, use and resistance to compression.

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.



XPS thermal insulation with the example of bitumen seal

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%.

DIN EN 1991-1 – Effects on supporting structures (previous 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 1/1/1991: 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 pressure

**Research on the
pressure resistance of
thermal insulation materials**

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

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	Jackson Insulation	300/390	130
Jackodur KF 300 Standard, d = 140 - 300 mm (single layer)	XPS	Jackson Insulation	300/390	130
Jackodur KF 500 Standard, d = 50 - 120 mm (single layer)	XPS	Jackson Insulation	500	180
Jackodur KF 500 Standard, d = 140 - 300 mm (single layer)	XPS	Jackson Insulation	500	180
Jackodur KF 700 Standard, d = 50 - 120 mm (single layer)	XPS	Jackson Insulation	700	250
Jackodur KF 700 Standard, d = 140 - 300 mm (single layer)	XPS	Jackson 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 boards T4+	Cellular glass	Foamglas	600	190
Foamglas boards S3	Cellular glass	Foamglas	900	250
Foamglas boards 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

The thermal insulation's required minimum compressive strength for the STANDARD-Pad 'kN' size = 109 cm², round **

Dimensioning case (least favourable)*

Slab format [cm]	Definitive Load condition	Thermal insulation's min. compressive strength [kN/m ²]		
		Corner piece 1/4 (27.25 cm ²)	Edge piece 1/2 (54.5 cm ²)	Whole pad (109 cm ²)
50 x 50 x 4.1 (concrete)	#3+5	1133.12	582.66	307.43
40 x 40 x 4.1 (concrete)	#3+5	1120.73	570.28	295.05
60 x 60 x 2.0 (ceramic)	#3+5	1120.73	570.28	295.05
80 x 40 x 2.0 (ceramic)	#3+5	1118.26	567.80	292.57

Measured value of the compression strength [kN/m ²]	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

Load situations examined*

Load situation #1:	Dead weight F _g
Load situation #2:	Dead weight F _g + distributed net load q _k category Z - 4.0 kN
Load situation #3:	Dead weight F _g + concentrated net load Q _k category Z - 2.0 kN
Load situation #4:	Dead weight F _g + distributed net load q _k category T2 - 5.0 kN
Load situation #5:	Dead weight F _g + concentrated net load Q _k category T2 - 2.0 kN

* Source of the calculations: WSP Engineers, Würzburg

**Please refer to the respective individual brochures for the figures for our other supports.



Important note: 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, www.austrotherm.de

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

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

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

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

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Schallfelder Weg 1 · 97516 Oberschwarzach

E-mail: info@plattenfix.de · www.plattenfix.de



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