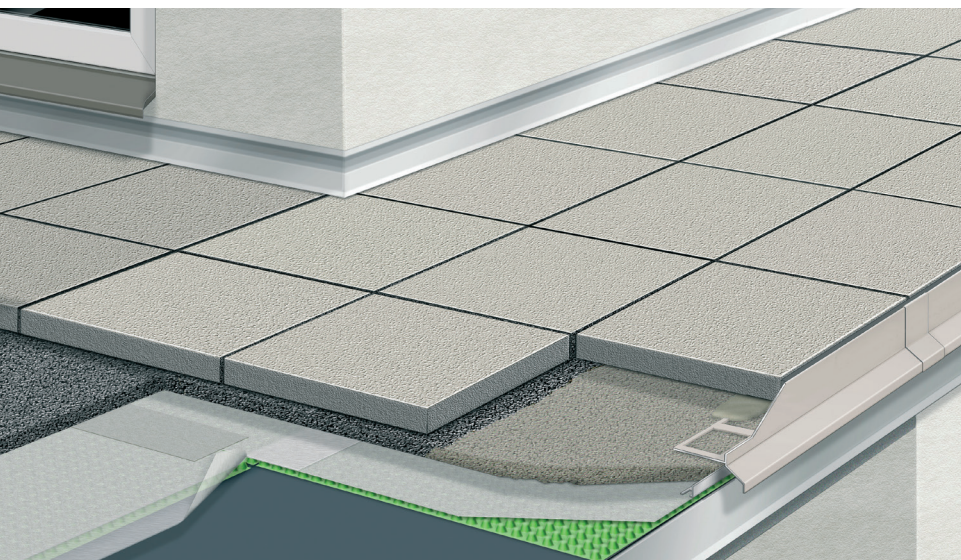
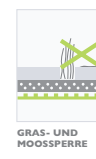
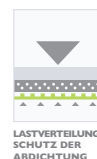
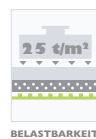
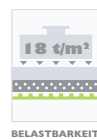


# PROCODRAIN S

**Drainage mat for loose laid coverings  
with and without ballast  
in outside areas**



## Fields of application:

PROCODRAIN S is a tilted drainage mat for secure drainage of loose laid surfaces and loose ballast in outside areas such as on balconies, patios, flat roofs, pathways or viewing terraces. The tough stud membrane and the sturdy, weather-resistant geotextile fleece laminated on the stud membrane prop up the covering laid on top.

As coverings, large format slabs made from concrete, natural stone or even artificial stone can be used as well as unbreakable and large format clinker elements or ceramic slabs. Moreover, tightly laid duckboards with narrow joints can be used that are laid on loose ballast as a means of height compensation. For height compensation, finer but water permeable sand mixtures can be used.

On level and pressure resistant underlayers, plaster or clinker stones can be laid directly in a herringbone or other, tightly meshed pattern.

On flat roofs that are not walked on, the drainage mats can be used under sufficiently thick (at least 5 cm) ballast for better deflection of rain water and melted ice/snow. Two stud heights are available depending on the evenness of the surface and the expected water quantity.

- For secure drainage of balcony and patio coverings made from concrete, natural stone and artificial stone laid loosely on ballast
- As drainage under coverings made from loosely laid plaster and clinker stone
- As drainage under ceramic elements with large format.
- As drainage under narrow-joint duckboard made from timber.
- As drainage under point bonded, large format and unbreakable ceramic slabs directly over the drainage mat (see additional data sheet)
- As drainage under ballast on flat roofs for better drainage and to protect the seal.

## Product advantages:

Through the use of PROCODRAIN S, water that collects over a period of time and can have a damaging effect is channelled and kept away from the back of attachments and coverings. PROCODRAIN S ensures fast drainage of rain water and melted ice/snow at a second drainage level. PROCODRAIN S reduces weed growth, algae formation and uncontrolled organic growth effectively on and in slab surfaces. It also reduces the degradation of coverings or chemical reactions such as grids and blisters caused by water accumulation on the back.

# PROCODRAIN S

At the same time, the rain water is deflected faster and better drying of the coverings takes place. In this way, the life cycle is increased and the appearance of the covering remains unblemished.

The sturdy stud membrane lies over the whole surface and protects the seals beneath and their separating layers from the strain of static and moving loads. At the same time, the drainage level and the layers built up above have a decoupling effect and thereby absorb noise from footsteps.

The layout of the studs enables unhindered longitudinal and lateral drainage. Laying patterns do not have to be adhered to. The sturdy geotextile fleece allows water to seep through quickly and supports the ballast and coverings laid above, thereby preventing any capillary effect.

- Stilted, anti-capillary, with high water drainage performance
- Fast deflection of water through unimpaired longitudinal and lateral water drainage
- Better drying of covering surfaces
- Improved aesthetics, function and service life of coverings
- Resistant to acid, root growth and rotting, poses no threat to drinking water
- Protective effect on seals – complies with DIN 18195 – has a load distributing effect

## Delivery form:

Strips rolled up and packed in a box, approx. 110 x 40 x 40 cm

PROCODRAIN S 8 mm			Art.no.: 93322
12.50 m/box	12 boxes/pallet	150.00 m <sup>2</sup> /pallet	
PROCODRAIN S 20 mm			Art.no.: 93323
6.15 m/box	12 boxes/pallet	72.00 m <sup>2</sup> /pallet	
PROCODRAIN S SV – Butt-joining tape			Art.no.: 93327
20.00 m/box			

## Storage and transportation:

The rolls should be stored and transported in a closed box, in a cool and dry place with protection against sunlight and contamination. Storage and transportation over longer distances should be in an upright position. The storage period under these conditions is two years.

## Specifications:

PROCODRAIN S		
	8 mm high	20 mm high
	Art.no.: 93322	Art.no.: 93323
Material	HDPE stud membrane with thermally bonded geotextile fleece backing	
Colour - membrane	Green	
Colour - geotextile fleece	Grey	
Width - membrane	approx. 100 cm	approx. 97.5 cm
Width - fleece	approx. 110 cm	approx. 110 cm
Fleece protrusion one-side lengthwise	approx. 10 cm	approx. 12.5 cm
Weight	approx. 0.6 kg/m <sup>2</sup>	approx. 1.1 kg/m <sup>2</sup>
Water deflecting capacity (as per DIN EN ISO 12958:1999)	approx. 4.6 ltr/m x s	approx. 12 ltr/m x s
Free drainage space	approx. 5.5 ltr/m <sup>2</sup>	approx. 12 ltr/m <sup>2</sup>
Rigidity at 10% compression up to	250 KPa	180 KPa
Temperature resistance	30°C to +80°C	
Chemical resistance	Resistant to acids usually found in the earth and inorganic acids.	
Biological properties	Resistant to bacteria and fungus, does not decompose and unaffected by root growth.	
Physiological properties	Does not pose a risk to drinking water	

PROCODRAIN S SV	
	Art.no.: 93327
	Self-adhesive butt-joining tape for PROCODRAIN S
Material	Geotextile fleece, approx. 140 gr/m <sup>2</sup>
Colour	Grey
Bonding	To double adhesive strips attached on both longitudinal sides
Fleece protrusion	approx. 10 mm on longitudinal sides
Tape width	approx. 15 cm
Weight	approx. 25 gr/m

## Disposal:

Offcuts and leftovers can be disposed of through the household and commercial waste system or recycled as plastic at recycling centres.

PROLINE supports the German Grüner Punkt (green dot) recycling system. Product packaging can be disposed of in the appropriate manner.



## Instructions on hazardous goods and substances:

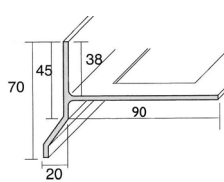
No special measures required.

# PROCODRAIN S

## Supplementary products:

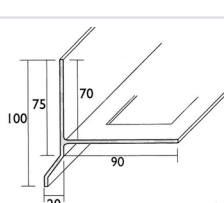

### PROCOFORM balcony edge profile WSE

Edge finish profile at open end of balconies and terraces with lower attachments. The profile is installed above the drainage strips. OK covering must always lie higher than OK profile.

Material	Aluminium, powder coated/untreated				
Types		Profile		External corner	Connector
Colours		Art.no.		Art.no.	Art.no.
	Light beige (RAL 1019)	70417		73517	79417
	Light grey (RAL 7035)	70440		73540	79440
	Autumn (RAL 8003)	70427		73527	79427
	White aluminium (RAL 9006)	70418		73518	79418
	Plain aluminium	70400		73500	79400
Height	70 mm				
Length of profile	3.00 m				

### PROCOFORM balcony edge profile K

Edge finish profile at open end of balconies and terraces with higher attachments. The profile is installed above the drainage strips. OK covering must always lie higher than OK profile.

Material	Aluminium, powder coated/untreated					
Types		Profile		External corner		Connector
Colours		Art.no.		Art.no.		Art.no.
	Light grey (RAL 7035)	72403		73403		79640
	Autumn (RAL 8003)	72405		73405		79627
	White aluminium (RAL 9006)	72406		73406		79618
	Plain aluminium	72401		73401		79600
Height	100 mm					
Length of profile	3.00 m					

### PROSTRIP S edge insulating strip

Fleece backed, fall-through safe PE edge insulating strip for lower installation heights with self-adhesive foot and clinging technique. Can be affixed securely to the drainage mat along rising installations, such as walls, doors, railing posts, etc.

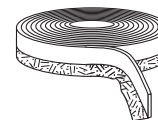
Height	Thickness	Length	Art.no.
50 mm	8 mm	25 m	93520



### PROSTRIP L edge insulating strip

Fleece backed, fall-through safe PE edge insulating strip for higher installation heights with self-adhesive foot and clinging technique. Can be affixed securely to the drainage mat along rising installations, such as walls, doors, railing posts, etc.

Height	Thickness	Length	Art.no.
100 mm	8 mm	25 m	93521



# PROCODRAIN S

## Preparing the substrate:

The substrates for the drainage strips generally consist of:

- Sealing strips and their recommended separating layers in accordance with DIN 18195 T5
- Fluid, strip or slab shaped joint seals
- Reaction resin seals or coatings
- Concrete surfaces, also without seals if necessary
- Flat, highly dense or flat laid and hardened subbase course.

The substances that come into direct contact with the drainage must not have any solvents or other substances that could damage the HDPE stud membrane.

Height differences in the substrate or seal (e.g. caused by overlaps) must not exceed 4 mm with 8 mm drainage mats and 14 mm with 20 mm high mats. Greater height differences should always be levelled out by suitable means to

- avoid puddles in the substrate.  
Puddles impair the drainage performance and, in the event of frost, can cause barrages.
- enable laying of the drainage mat evenly and over the entire surface. Uneven substrates impair the durability of the structure.

The surfaces to be laid must have a slope of between 1% and 3%. Larger slopes should be avoided.

The structures beneath the drainage mats must be suitably secure to take the intended loads and must not give under pressure or resonate.

This applies to insulating materials under the seal in particular. Ideally, XPS insulating material, PU insulating material or foam glass insulating material should be used that can withstand compressive stress in excess of 300 KPa at 10% compression. If point loads are expected, suitable insulating materials and sealing strips should be used for this purpose.

## Preparatory measures:

Simply unroll PROCODRAIN S and lay over the area. Use a sturdy craft knife or carpet scissors to cut to size. The strips must be adapted free of constraint forces to adjacent components with connection joints of at least 10 mm. The studs and laminate must always face upwards. The membrane strips are butted up tightly against each other and held down until laying with stones or gravel.

The lateral overlaps of the geotextile fleece always lie completely on the laminate of the neighbouring strip. The overlaps up to the upper edge of the surface run next to rising components and along the edge strip or are cut off at this height at a later stage.

At joints, connections and along rising components at which no overlapping zones are present, the PROCODRAIN E SV butt-joining tape is bonded down in such a way that gaps or clefts in the strips, or at the end of rising components, are completely and permanently covered.

*At regular intervals, ensure that the supporting fleece is not perforated on the surface and that all connections and butted joints with overlaps and butt-joining tape are sealed so that no ballast or particles of dirt can make their way into the drainage space under the fleece.*

Secure boards or formwork boards on the laid surface for work access or transport paths.

The laid strips that have been secured with butt-joining tape should then be covered at once with the floor covering. At low outside temperatures, the unrolled and weighed down strips can remain in position uncovered (even over a few days) so that they can acclimatise.

At the end of rising components, PROSTRIP S (50 mm) or PROSTRIP L (100 mm) is bonded with the self-adhesive bottom part to the fleece of the drainage mat.

If edge strips are bonded to the seal before the drainage mat is laid, the gap between the drainage mat and edge strip is covered using PROCODRAIN GK SV butt-joining tape.



PROCODRAIN S

Laying coverings:

Uneven substrates

With uneven substrates, the drainage mat should always be levelled with ballast made up of broken (gravel) and/or screened aggregate. The aggregate selected must be drainage-suited. Its grading curves contain no grading fractions below 2 mm (e.g.: 2-5 mm; 4-8 mm). The height of the levelling ballast should be at least 3 times the size of the largest grain size of the grading curve used.

This aggregate is also suitable as a joint filler. To fill tighter joints, a grading fraction 1 – 3 mm can also be used.

The aggregate must not contain any elements that could lead to corrosion and staining (e.g. pyrite, biotite glimmer) or substances such as limestone that store moisture.

Broken aggregate provides a more solid and compact levelling ballast. At open ends of the surface, the ballast is cemented in (similar binding material suitable for outside areas can also be used) at a width of approx. 30 cm to stabilise the outer row. The slabs or stones above this are laid on the cemented levelling ballast with flexible mortar on the back (at least C2 S1) and tapped in place. The flexible mortar must be suitable for outside areas.

The cemented levelling ballast must maintain its drainage capacity. No flexible mortar may escape into the joints.

Flat, level substrates

Where substrates are absolutely flat and level (e.g. joint sealing or thin membrane sealing with low overlapping zones (height offset <1.2 mm)), covering material can be laid directly on the drainage mat.

These covering materials must not have any corners, edges or points on their underside that could damage or perforate the geotextile fleece and must exhibit an even material thickness (e.g. chamfered paving clinker stones).

If laying directly on the drainage mat, make sure that the slabs or stones have a smaller contact area so that they can come into full contact and maintain this contact permanently. The slope of the ground should not exceed 2%. At open ends of the surface, the ballast is fixed onto the geotextile fleece of the drainage mat using a flexible mortar suitable for outside areas (at least C2 S1) at a width of approx. 30 cm to stabilise the outer row. Ideally, the flexible mortar should be applied to the back of the slabs or stones. The joint space should be free of mortar of any kind.

General:

The covering material must be large and heavy enough to cope with the expected load.

The slabs should remain in place under their own accord when they are walked on or rolled over with light loads and must not be able to be levered out.

They must have sufficient resistance to bending and compression and be suitable for laying in outside areas.

Suitable covering materials:

Type of material	Concrete or natural stone slabs	Ceramic elements	Paving and paving clinker stones
Minimum size	30x30 cm (on 8 mm mat) 40x40 cm (on 20 mm mat)	50x50 cm	
Minimum surface area			200 cm <sup>2</sup> in combination secured against shifting (e.g. herringbone pattern) with allocated, filled joints (2-5 mm)
Minimum weight	13 kg/slab	–	2.5 kg/stone

If joints are well filled and slabs or stones are laid in a pattern, the covering material is better supported, the load capacity is increased and canting is reduced.

It may be necessary over time to refill the joints. The aggregate used to fill the joints can be bonded in advance, if necessary, using suitable cement or binding agent, thereby providing better protection against being swept or washed out.

Duckboard structures

With duckboard structures, the boards must be at least 12 cm wide and the spacing must not exceed 60 cm. The minimum thickness of the boards, their spacing and width are orientated around the mechanical loads that are expected. They should be resistant to bending. (See also: Technical handbook 'Timber terraces/decking').

Ideally, the boards should be placed on gravel ballast throughout. The use of drainage mats provides better protection to the sealing layers and allows the timber to dry better.

Grassy areas can be landscaped above drainage mats to drain excess water to substrate layers that have sufficient storage capacity. At the transition to different adjacent covering structures, ensure that no topsoil, substrate elements or organic waste can be washed into the drainage level.

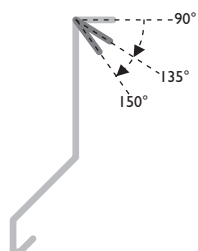
# PROCODRAIN S

## Finishing open surface ends with PROCOFORM balcony and terrace profiles:

Cut the PROCOFORM profile to the respective length and lay on the drainage mat.

Where PROCOFORM external corners join or between two bar sections, allow a space of approx. 5 mm and cover from the outside with a PROCOFORM connector.

To do this, fit a connector and bend the upper horizontal panel section over the upper edge of the profile by approx.  $135^{\circ}$  -  $150^{\circ}$ . The gap on the inside should be covered with a section of PROSTRIP S or PROSTRIP L of approx. 5 cm over the entire inner height of the profile.

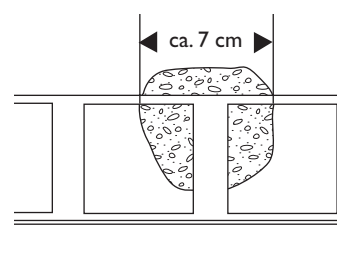


Align the profile to the desired direction and height.

To do this, apply a quick hardening flexible mortar suitable for outside areas (at least C2F S1) approx.

every 50 cm in lump form under the strip of the profile

and fix the profile in it once it has been aligned. If necessary, use plastic shims or tile strips to support the height. The lumps should have a diameter of approx. 7 cm and enclose the T in the profile strip. The mortar escaping upwards should be scraped off with deep channels so that the following bound ballast can take a hold in them.



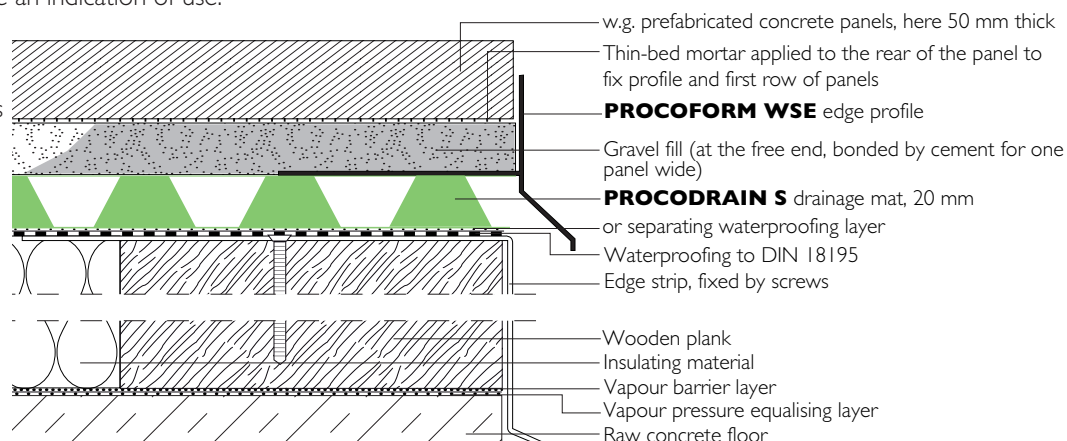
# PROCODRAIN S

The following illustrations give an indication of use:

## 1. PROCOFORM

### WSE edge profile

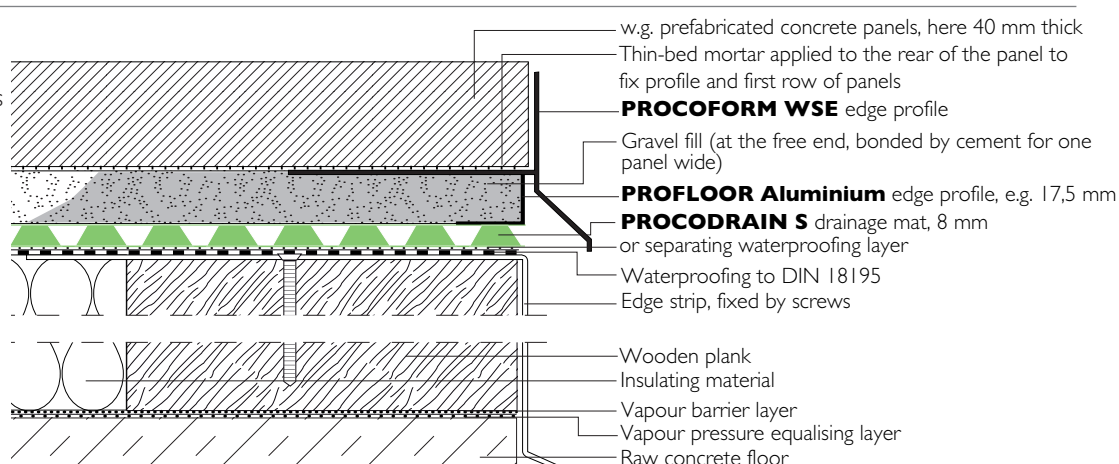
for approx. 30 mm thick slabs



## 2. PROCOFORM

### WSE edge profile

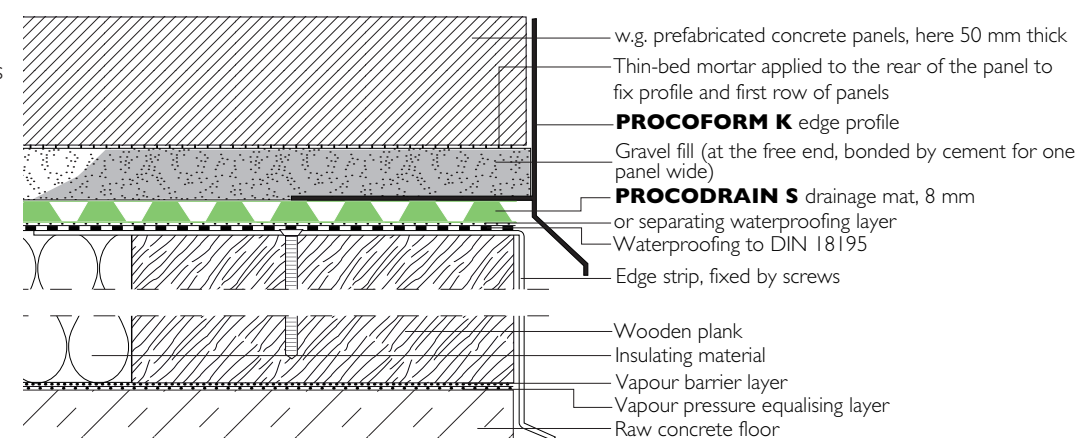
for approx. 40 mm thick slabs



## 3. PROCOFORM

### K edge profile

for approx. 50 mm thick slabs



# PROCODRAIN S

For a flexible height finish, a PROFLOOR angle profile made from stainless steel or aluminium can be inserted above the drainage mat first as a 'lost shell lining' for the bound ballast at the designated height.

To do this, apply a quick hardening flexible mortar suitable for outside areas (at least C2F S1) approx. every 30 cm in lump form under the strip of the profile and fix the profile in it once it has been aligned. If necessary, use plastic shims or tile strips to support the height. The lumps should be approx. 4 cm wide and 7 cm long.

The mortar escaping upwards should be scraped off with deep channels so that the following bound ballast can take a hold in them.

Once the flexible mortar has hardened sufficiently, the bound ballast can be spread over the profile.

Now bed in the edge profiles with flexible mortar, which should be applied approx. every 50 cm in lump form on the bound ballast, coarsely comb flexible mortar on the backs of the slabs or stones and press fresh in fresh if possible into the bound ballast, tapping in lightly where necessary.

The joints must be kept free of flexible mortar.

In general, ensure that the upper edge of the profile is always lower than the upper edge of the floor covering.

50% of the slab thickness should be covered by the profile from the bottom up.

## Connection to drainage troughs and grids for façade or surface drainage:

Drainage lines or drainage points installed for façade drainage or for further surface drainage are positioned directly on the sealing level via requisite protective layers where necessary and are aligned in height and direction.

The drainage mats are cut up to the frame of the grids. PROSTRIP S or PROSTRIP L edge strips are bonded to the drainage mat along the frame.

To prevent ballast from falling down under the grid, suitable gravel stops are fitted to the edge strips at an angle and weighed down with loose ballast.

The joint between the frame and slab above the edge strip is filled with elastic filler (natural stone silicone or similar), thereby fixing the frame or grids. The frame or grids must be sturdy enough and stand on their own securely.



# PROCODRAIN S

## Important information:

- Depending on outside temperatures, it may be necessary to unroll the strips, weigh them down and allow them to acclimatise for up to a day so that they lie flat and even on the substrate.
- From adjacent ground, no substances or water should be allowed to make their way into the drainage space from the outside. If necessary, suitable protective measures (e.g. drainage pits filled with coarse stones and seepage pipes) can be implemented in front of the patio or terrace. Water should be allowed to escape from surfaces laid with drainage mats by way of suitably deep, adjacent and water deflecting ground.
- In the details of the slab and stone manufacturers, a width of 2-5 mm is almost always recommended for the joints between the slabs. If laying coverings without joints, the warranty of the slab manufacturer is usually rendered void. These joints should be filled with drainage-suited crushed sand (gravel) with a grading curve  $\geq 1-3$  mm.
- Clinker and paving stones or covering material without ballast must always be permitted to lay on the surface evenly and with full contact. If this condition is not met, the covering material is not suitable for the application.
- If using drainage mats under vegetation layers, sufficient protection against root growth for the sealing layers must be provided as well as a suitably strong separating layer above the drainage mat.
- In general, loosely fitted slabs and stones are not to be protected against shifting and canting nor subsidence. It can be expected that loosely fitted coverings will settle and sag over time and, depending on the frequency of mechanical loads and movement, might mean that individual slabs or surfaces may need to be relaid at a later time.

## Standards and regulations:

*It is recommended to refer to and comply with the following standards and regulations:*

- DIN 18195 'Building seals'
- Rules and standards of the German roofing trade 'Trade regulations for roofs with seals'
- ZDB bulletin 'Outdoor flooring'
- DIN 18024 'Barrier-free constructions'
- DIN 18025 'Barrier-free flats'
- DIN 1986-100 'Water drainage systems for buildings and plots of land'
- Technical information concerning ashlar 1.4 'Outside flooring' from German Natural Stone Association
- Technical information concerning ashlar 1.3 'Solid steps and step covering outside' from German Natural Stone Association
- DIN EN 12004 'Mortar and adhesive for tiles and paving'
- DIN EN 12002 'Mortar and adhesive for ... / Determining the shape'

*All information, references, instructions, basic engineering principles, regulations, standards and expertise are based on German and largely equivalent European regulations and training standards, irrespective of additional country-specific supplements and amendments.*

*All our specifications are based on our experience and careful analysis. We are unable to examine or influence the diversity of associated materials used and the various construction site and processing conditions in detail. Fulfilment of an imposed work order and verifiable functionality of the object therefore depends on the observation of current VOB rules and the recognised rules of technology.*

*Our details do not absolve the accountable planner's and fitter's obligation to assess - on their own authority - the building conditions and practicability of the products. In case of doubt, carry out your own tests or seek technical application advice. Please refer to the laying and processing guidelines of the floor covering manufacturers or the manufacturers of associated products.*

*All product data sheets previously published are superseded by this product data sheet once published.*

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