The suitable solution for any task

ACO façade drainage

30

Profiline Free
The façade channel for the TÜV-tested zero threshold

ACO façade drainage

Content

Equipped for all weather conditions

ACO façade and terrace channels serve to meet the requirements of the regulations and prevent water being pressed upwards as a result of the wind load or collection in front of particularly endangered areas. The creation of snow drifts, slush and ice should also be taken into account here. Snow drifts in front of doors melt first due to the heat radiation in this area. This can impede the drainage of the melted water as a result of the residual snow or slush. As a result, the drainage channels must also be particularly well suited for these kinds of water loads. **The channel height must be adjusted to the actual moisture load** . **Corresponding hydraulic verification** can be provided by the application technology department at ACO Building Material at any time.

Important criteria for assessing the efficiency of drainage channels are their location, the size, the opening cross-section of the cover and of the channel body and the installation situation.

A drainage channel will only be able to function **with full effect** when reducing the risk of moisture near a door sill,ifit covers the **entire width** and is arranged correctly in front of it. This is usually the case if the distance is not more than **5 cm**.

Most of the deposits caused by dirt are retained by the channel body and can be easily removed via the channel base without damaging the sealing ring. Regular maintenance should be a matter of course here.

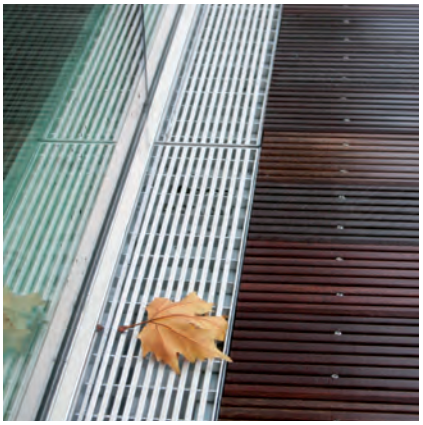
To drain terraces, the surface water and suspended substances are discharged via the lateral drainage slots into branch channels that lead to the gullies, in the free area below block pavements on raised floors/sacks of mortar and/or into the drainage layer. The drainage slots may not be smaller than 4 mm, otherwise there is a risk of sintering.

Using gravel that is smaller than 4 mm is non-critical because experience has shown that the chips jam and means very little gravel penetrates the drainage slot and into the channel. If deposits collect on or in the grating through an inserted **dirt fleece,** the entire design must be seen as **critical**.

One-sided perforation of channel bodies on the façade **does not make sense,** because this is a loosely installed open channel system in which the moisture also forms on the façade side. If there is two-sided perforation of the channel sides, the moisture can be seen as without pressure and fast drying.

For technical details see next page.

ACO facade channels and gratings are not only characterised by their sophisticated design, but also by technical aspects such as drainage performance and protection of the building structure



Draining façades, balconies and roof gardens

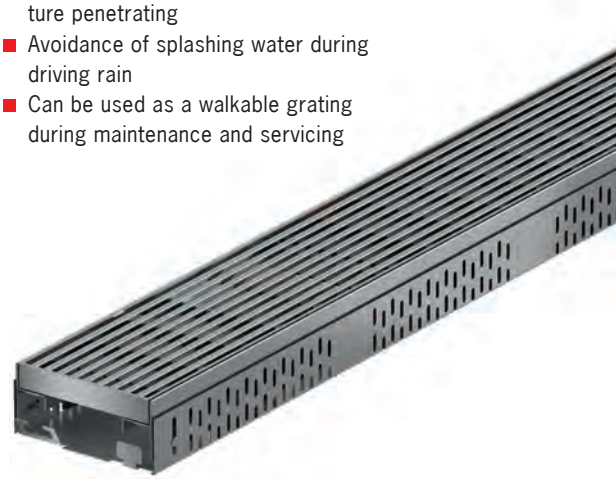
Steps must be taken to ensure that no moisture can penetrate the building from the outside, especially in sensitive door and façade areas of terraces, roof gardens and balconies at any time. ACO façade channels guarantee this and discharge even large amounts of rain safely and quickly by means of backflow reserves.

Available in stainless steel and galvanised steel versions, the ACO façade channels go perfectly with all complex architectural building projects.

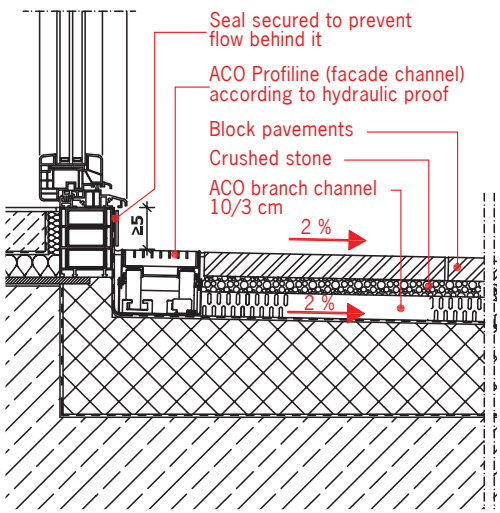
Various design variants can be achieved by utilising the different grating designs. Thanks to the variable height adjustment, millimetre-precise fitting on site soil conditions is possible. This means that ACO not only facilitates the future-oriented demand for barrier-free construction, nut also meets the quality requirements of architects and planners.

Advantages of façade gutters

- Safe and fast discharging of even large volumes of rain
- Additional backflow reserve for sudden deluges
- Avoidance of water pools near the façade
- Protection on the inside from moisture penetrating
- Avoidance of splashing water during driving rain
- Can be used as a walkable grating during maintenance and servicing

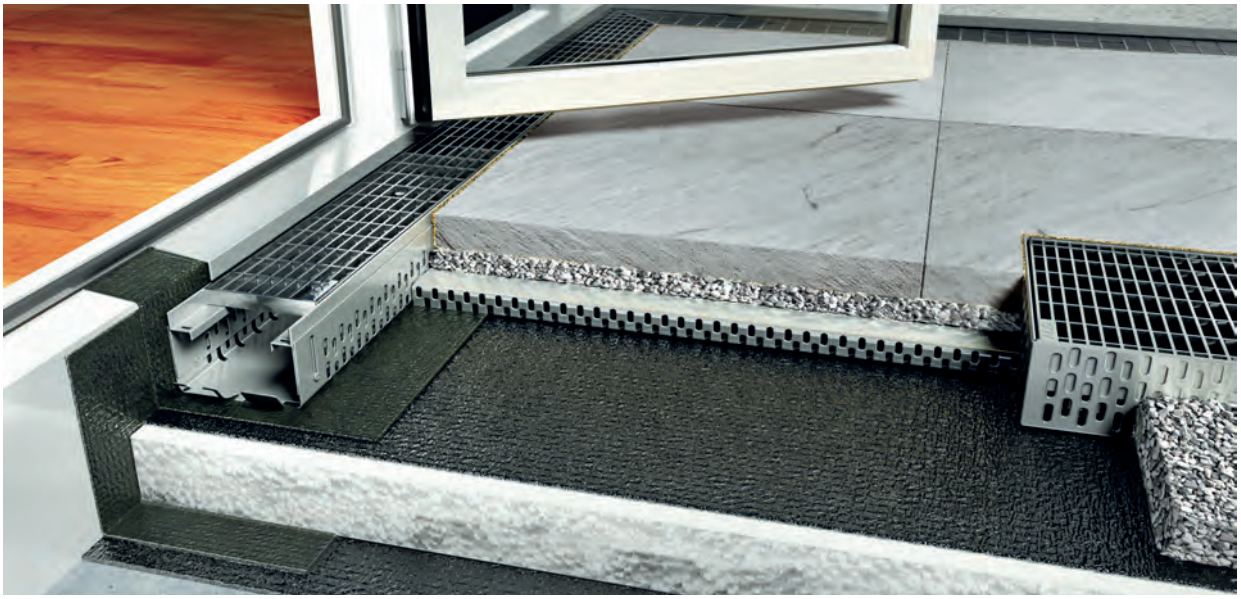


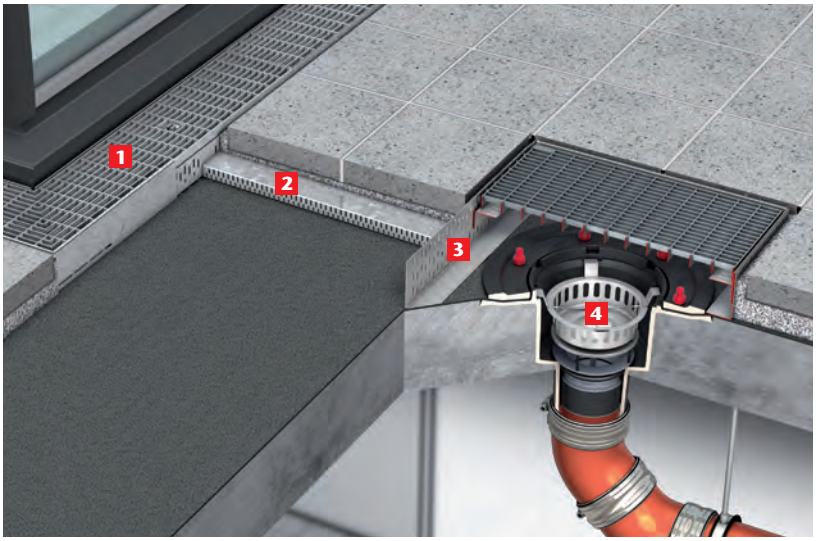
Technical details



Reduce door connection height
Steps must be taken to ensure that no moisture can penetrate the building from the outside, in sensitive door and façade area. The 15 cm connection height for building seals specified in the DIN 18531 and the Flat Roof Directive can be reduced to 5 cm by using the ACO linear drainage profiline next to the door area.

Amendment of the Flat Roof Directive 12/2016 "if the splashwater volume is not minimised by a roof, mesh gratings that are at least 150 mm wide should be used".





ACO facade channel Profiline

System structure in front of the terrace door

1 | Channel or branch channel connection element
2 | Branch channel
3 | Gully top for roof gullies
4 | Roof gully

Moisture load
The actual moisture and water load depends on the region where the building project is located, i.e. on the intensity of rainfall and snowfall, and the prevailing wind directions and available protection, e.g. roofs. A corresponding assessment can be provided by the application technology department at ACO Building Material at any time.

Water-carrying layers
The sealing ring and coating level are seen as the water-carrying layers. On reversed roofs, this also includes the insulation level.

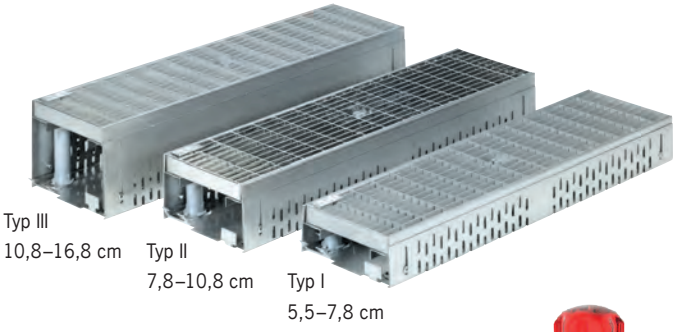
Slope
The sealing ring level should have a planned slope of at least 2% falling away from the connecting point. The coating level should have a planned slope of at least 2% falling away from the connecting point (1.5 % DIN 18531-5).

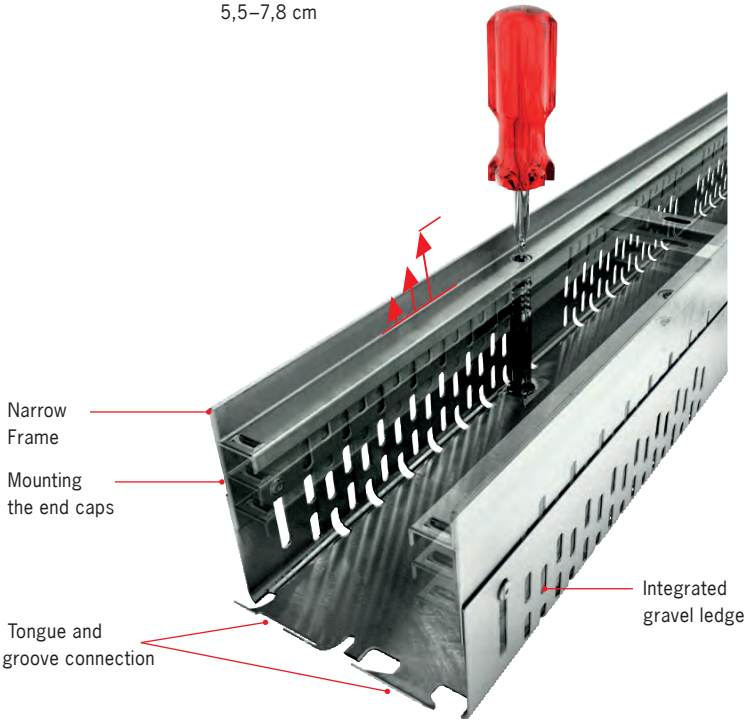
ACO branch channel and gully tops for roof gullies
There are accessories comprising a branch channel and variously sized gully tops for roof gullies as maintenance shafts for the channel systems ACO Profiline and ACO Greenline. The **branch channel** is a 3 cm high and 10 cm wide hollow body with lateral 4 mm drainage slots. Its front side is openly joined to the branch channel connection elements and the gully top for roof gullies and/or butt joined to the drainage slots of the channel body and the gully top for roof gullies, and lies within the drainage layer. Therefore, it connects the channel body and the gully top, and forms a defined drainage channel and/or **is a direct connection of the channel to the gully tops.**
The gully tops for roof gullies on terrace surfaces must be arranged across the roof gullies as inspection shafts. Mesh gratings that are permanently integrated into the terrace floor may not be permanently connected to the roof gully at the same time.
For accessories see Page 12/13.

Variable and fixed building height

The pre-assembled channel elements of the ACO Profiline have no loose individual parts. This means that the channel trains in the modular system can be installed extremely efficiently. The channel elements are connected to one another using a simple plug system with tongue and grooves. This plug system guarantees additional safety when processing on the sensitive sealing ring.

To ensure optimum drainage, drainage slots (4 mm) are provided on the sides, which extend to the lower edge. Thanks to the integrated gravel ledge, no special attachment is necessary. The continuously closed channel base guarantees excellent stability and load distribution. The compensation elements also allows free adjustment of the length of the channel body.





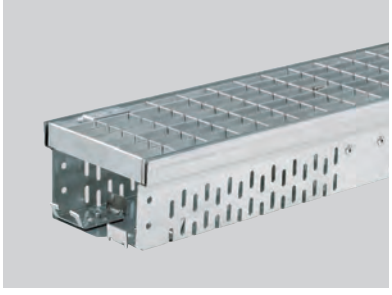
Variable overall building height
The height of the ACO Profiline system with its freely adjustable building height is adjusted with a screwdriver very easily at the top, which means it can also be adjusted once in a built-in condition.

- No precise construction height needs to be defined in the planning phase
- If the overall structure settles, the channel system is simply and easily readjusted
- flexible compensation of longitudinal slopes

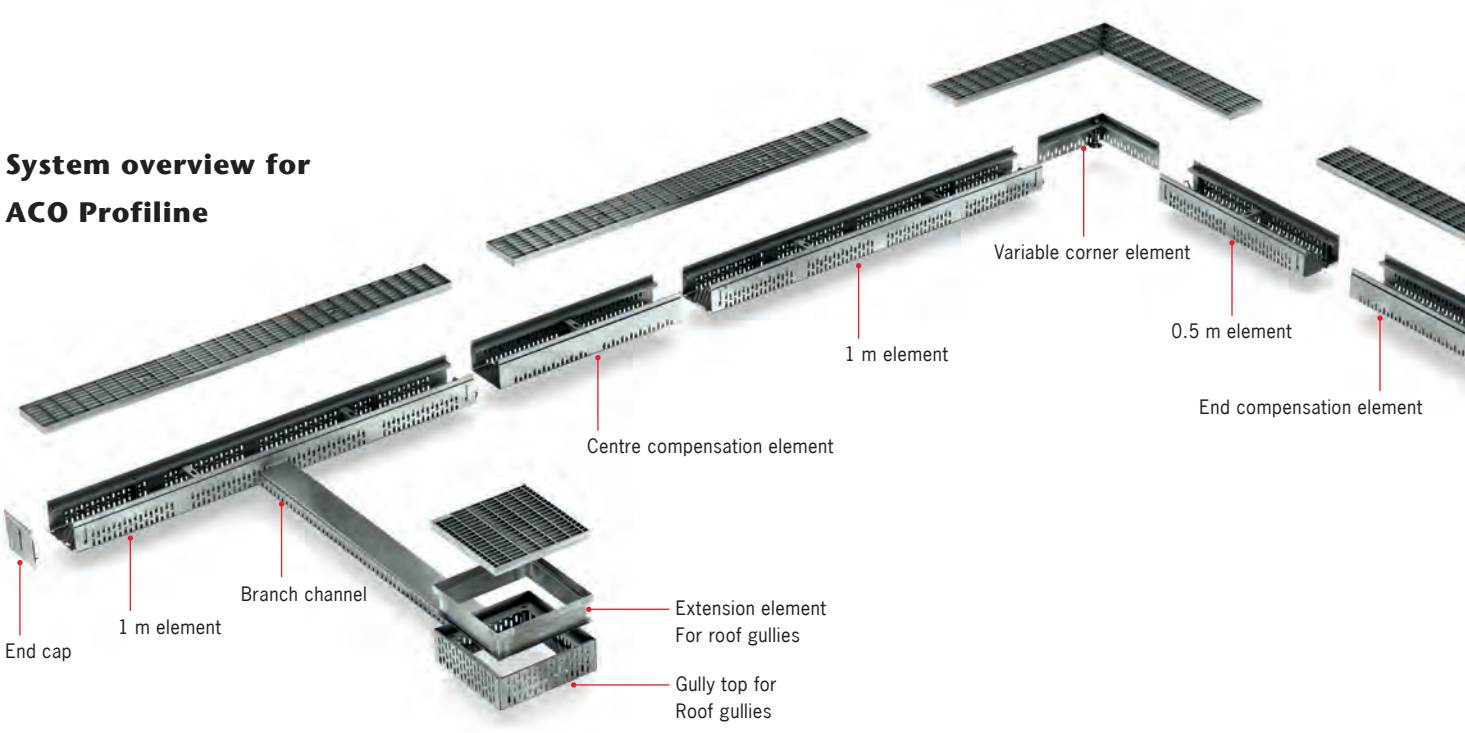

Height adjustment


Grating stop

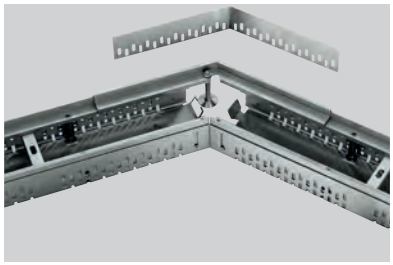
Fixed overall building height
The ACO Profiline system with a fixed building height of 2 cm/ 3 cm/ 5 cm / 7.5 cm and 10 cm not only offers the height adjustment but also all the benefits of an adjustable system.


ACO Profiline with a fixed building height

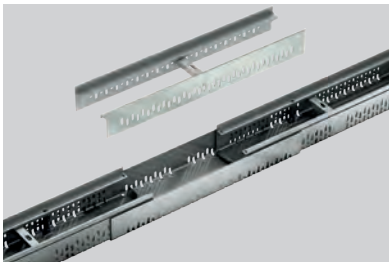
System overview for ACO Profiline



Supplementary elements

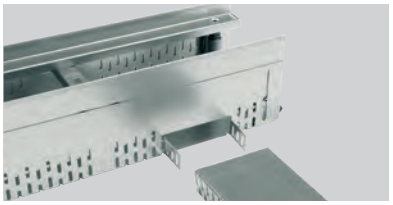


Variable corner element
The variable corner element allows any angle up to 90° without time-consuming cutting of the channel body. A connecting piece is placed on the channel element and guarantees excellent stability as a grating support. (Does not fit on the compensation element)

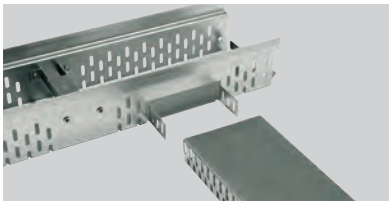


Centre compensation element
The length differences are compensated with the centre compensation element. It is simply placed between two channel bodies and allows free length adjustment of 5 to 50 cm between at least two channel elements.
E.g. 1.35 m:
2 x 0.5 m channel elements
1 x centre compensation element

End compensation element
The end compensation element also allows free length adjustment of 10 to 55 cm behind or in front of a channel element.
E.g. 0.89 m:
1 x 0.5 m channel elements
1x end compensation element



Branch channel connection element
The branch channel connection elements fulfil the requirement for direct and/or indirect connection to a drainage system. The side wall can be opened, the branch channel is inserted over the upright side parts. These affix the branch channel in position during processing.



The elements are each 0.5 m long and can be inserted at the corresponding point in the channel train. The other end of the branch channel ends on the gully top for roof gullies that also needs to be opened. der ebenfalls zu öffnen ist.

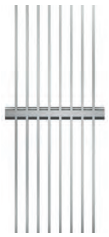
End caps
The end caps serve as a variable or fixed element to close the channel body.

GRATINGS FOR THE ACO PROFILINE

Ladder grating
Inserted, locked grating
- **Steel, galvanised**
  Width 13 cm
- **Pickled stainless steel**
  Width 13 cm

Mesh grating
Inserted, locked grating
- **Galvanised steel**
  with mesh width 30 x 10 mm
  Construction width: 10/13/15.5/20/25 cm
- **Stainless steel**
  with mesh width 30 x 10 mm
  Construction width: 10/13/15.5/20/25 cm

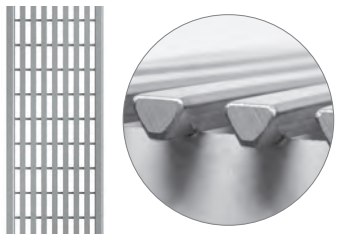
Perforated grating
Inserted, locked grating
- **Steel, galvanised**
  Width 10/13 cm
- **Stainless steel**
  Width 10/13 cm



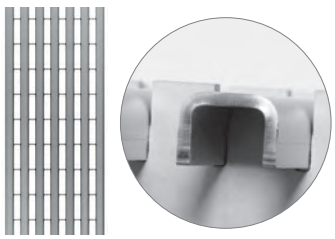
Longitudinal bar grating
Inserted grating, without stop
- **Steel, galvanised**
  Width: 13 cm/15.5 cm
- **Stainless steel**
  Width: 13 cm/15.5 cm

Longitudinal slot grating
Inserted grating, without stop
- **Stainless steel**
  Width 13 cm

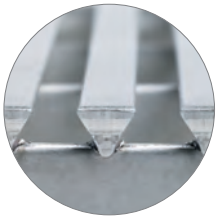
Plastic ladder grating*
Inserted grating, without stop
- **PE-HD recyclable**
  Width 13 cm



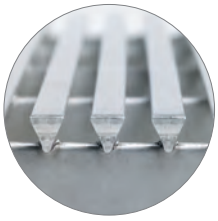
Longitudinal bar grating
Inserted grating, without stop
- **Brushed stainless steel**
  Widths: 13 cm/15.5 cm



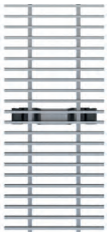
Longitudinal profile grating
Inserted grating, without stop
- **Steel, galvanised**
  Width 13 cm
- **Pickled stainless steel**
  Width 13 cm



Heelsafe (coarse)
Inserted grating, without stop
- **Stainless steel**
  Width 10/13 cm



Heelguard (fine)
Inset grating without stop
- **Stainless steel**
  Width 10/13 cm



Crosswise rod grating
Inserted grating, without stop
- **Steel, galvanised**
  Width: 13 cm
- **Stainless steel**
  Width 13 cm

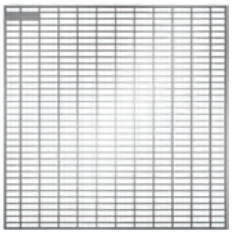
Cover gratings in length 50 cm and 100 cm,
*Plastic ladder grating only available in 100 cm length

ACCESSORIES FOR ALL SYSTEMS

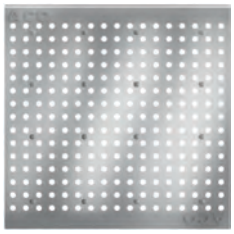
Gully tops for roof gullies
According to the Flat Roof Directive, removable mesh gratings are arranged over rood gullies on terraces. The gully top for roof gullies from ACO guarantee free access to these gullies and need to be freely adjusted to the height of the overall structure. Roof gullies are available in stainless steel or galvanised steel.

- **height-adjustable**
  Type I 5.5 – 7.8 cm
  Type II 7.8 – 10.8 mm
  Dimensions 30x30/40x40/50x50 cm
- **Fixed overall building height 5 cm**
  Dimensions 30x30/40x40/50x50 cm

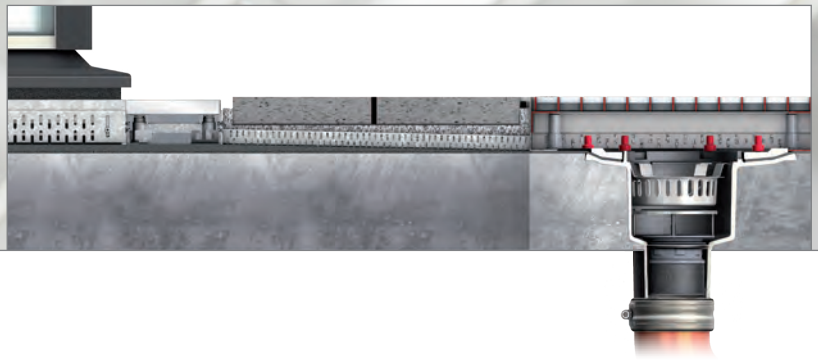
Grating locking device
It is also possible to retrofit the locking device for gully tops for rood gullies. Basically, only **mesh gratings** in attachments and extension elements can be locked.
(Attention: System change 05/2016).

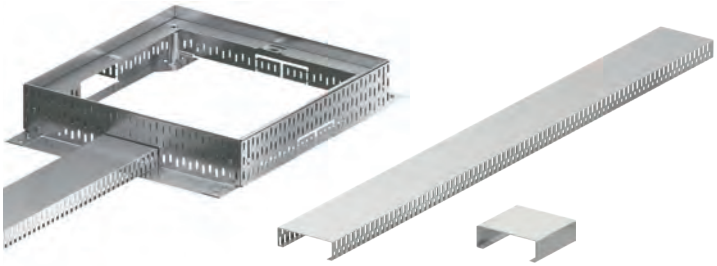


Mesh grating
Inserted grating, without stop
(Retrofittable stop)
Mesh size 30x10 mm
- **Steel, galvanised**
- **Stainless steel**



Perforated grating
Inserted grating, without stop
- **Pickled stainless steel**





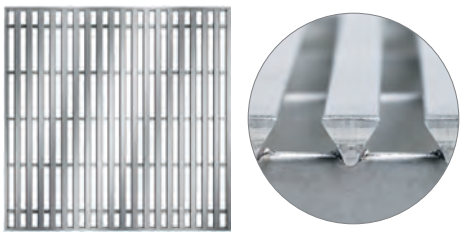
Extension elements for gulley top
The extension element is available in three different dimensions and building heights and can therefore be adapted to any building height thanks to the height adjustment feature. Several extension elements can be used on top of one another to cover greater height differences. A cover grating can be inserted easily.

- Elevation by 3, 6 and 12 cm
- Dimensions 30x30/40x40/50x50 cm
- Material stainless steel or galvanised steel

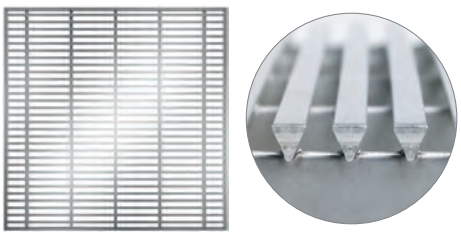
Branch channel connection on the gully top
The branch channel connection elements fulfil the requirement for direct and/or indirect connection to a drainage system. All four sides of the gully top for roof gullies offer the possibility of connection. This means that it can also be used as a maintenance and cleaning shaft. If used as a cleaning shaft, we recommend installation approx. every 4 m. Actual rinsing can be carried out with a simple garden hose.

The branch channel is placed loosely on the gully top for roof gullies and is affixed in the gravel bed by the overall system.
It guarantees the free cross section between the channel body and the gully top for roof gullies.

- Length 100 cm / 200 cm
- Width 10 cm
- Building Height 3 cm
- Material stainless steel or galvanised steel
- Can be extended by means of branch channel connector



Heelsafe (coarse)
Inserted grating, without stop
- **Stainless steel**



Heelguard (fine)
Inserted grating, without stop
- **Stainless steel**

All cover gratings in the dimensions
30 x 30 cm, 40 x 40 cm and 50 x 50 cm

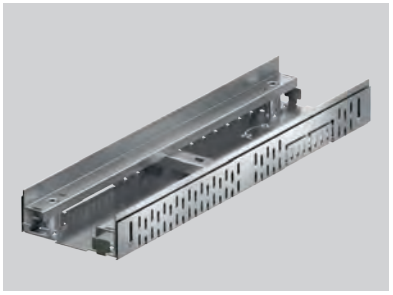
Draining ceramic coverings

When using open façade channels in areas that have contact to the earth, including ceramic surfaces, ensure that moisture is directed to the base area. The channels must be connected in any case. To this end ACO supplies two possibilities: one with a direct connection to the bottom via an eccentric **plug-in socket** that goes from a diameter of 60 mm to DN 100, or a **reveal gully element** that can be connected on laterally and protrudes over the foundation or protruding thermal insulation.

Possibility 1:

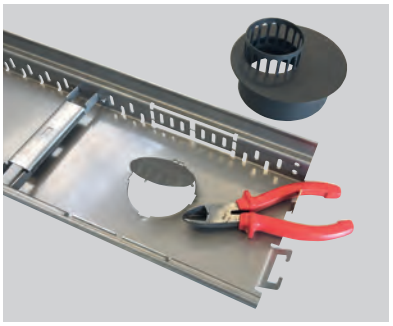
ACO Profiline plug-in socket
Eccentric from 60 mm to DN 100

If the façade channel can be directly connected below, there is a plug-in socket Ø 60 mm to DN 100 that can be placed eccentrically into the channel base. The connection can be positioned very well by turning it. The dirt trap also prevents coarse dirt from entering.

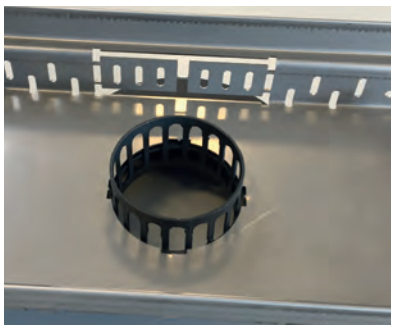


0.5 m element: designed for all connections

Preforming



Opening the perforation in the soil



linserting the plug-in socket

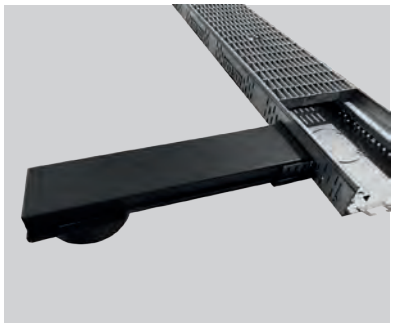
Possibility 2:

ACO Profiline reveal element

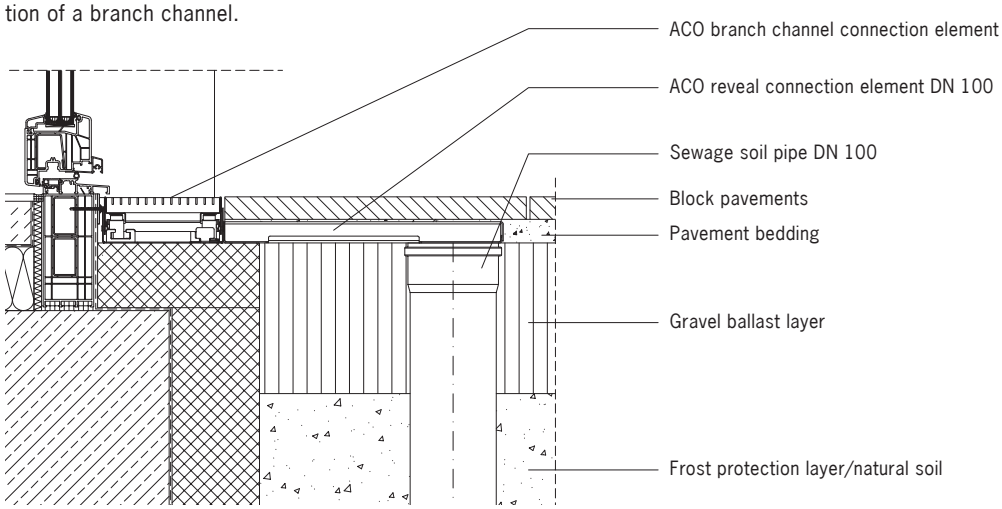
Opening the perforation in the side wall and connecting the reveal gully element with an inspection option and connecting to a DN 100 drainage line

Frequently, only the channel side is available for a direct connection to the drainage in the reveal area. Thanks to the selected design, the reveal gully element can be placed on the branch channel connection and can also be inspected after installation; it can also be connected to a DN 100 pipe system. The reveal gully element supplements the ACO Profiline facade drainage system and is a further variant in addition to the installation of a branch channel.

Reveal drain element open



Connection to drainage pipe



Highlights des Rosteprogramms

Mesh grid 30/10* with stop

Heelsafe (coarse)

Heelguard (fine)

Heelguard (fine)

Crosswise rod grating

Longitudinal bar grating*

Longitudinal profile grating

Longitudinal ladder grating*

*Grating for width 15.5 cm

ACO Profiline wood terrace channel

The transition to the wood terrace is a sensitive area, standing water will lead to damage to the building in the medium term. High risk areas are the entrance areas without an effective porch where low sill designs are used.

ACO Profiline has been specially adapted to the requirements of wood terraces: With a overall height of 2 cm, the system fits into any plank thickness. The channel train joint lies directly there at a distance of 50 cm from the foundation. The maximum sleeper distance is 70 cm The drainage slots are used for attachment near the sleeper.

The sealing height on the ascending façades is clearly regulated in the listed norms and regulations.

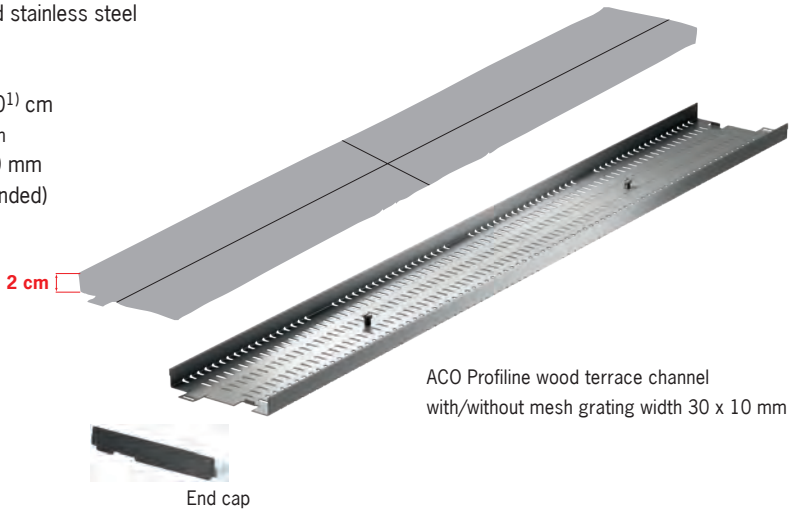
- DIN 18531/DIN 18533
- Recommendation for planing, construction and maintenance of the transition areas between open areas and FLL buildings
- Flat Roof Directive 12/2016

It says here that the sealing ring for preventing floor moisture and any backlogged seepage water must be installed 30 cm above the top edge of the railing, so that when finally installed, a distance of 15 cm from the top edge of the finished coating to the upper end of the sealing real is not undercut. (Note: A building sealing ring is integrated into the wall construction and is possibly not be visible from the outside). If the connection height of the sealing ring (15 cm) is undercut, a high-performance drainage system needs to be planned.

It is also necessary to significantly reduce the splash water volume. The wooden flooring alone cannot achieve this.

System

Material:	Galvanised steel and stainless steel
Overall construction widths:	13 and 15.5 cm
Overall height:	**2 cm**
Overall length:	50, 100, 150[1)], 200[1)] cm
	[1)] only in width 15.5 cm
Cover grating:	Mesh grating 30x10 mm with stop (recommended)
Accessory:	end cap



ACO Profiline wood terrace channel with/without mesh grating width 30 x 10 mm

End cap

For assembly see page 42

Highlights of the grating programme

Mesh grating 30/10

Heelsafe (coarse)

Heelguard (fine)

Longitudinal slot grating

Perforated grating

Longitudinal bar grating

Longitudinal profile grating

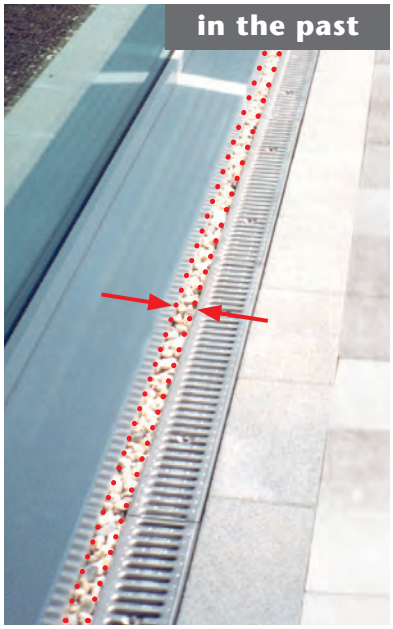
Longitudinal bar grating

ACO Profiline wedge-shaped

The patented ACO Profiline wedge-shaped channel is specially adapted to the specifications of difficult connecting points. With its 5cm channel body that protrudes on one side, it bridges e.g. any wedges formed by the sealing ring or thermal insulation that lies on the connecting point.

By pushing the branch channel into the channel body, the channel is securely positioned and any possible tilting of the channel is prevented. To do this, the side wall of the channel is opened, the branch channel is pushed in and connected to the covering so that the channel does not tilt despite the slope. Up to 4 branch channels can be used.

We recommend at least two branch channels with a length of 50 cm and a 40 x 40 cm plate counter bearing. Alternatively, the branch channel can be affixed elsewhere, e.g. By screwing it to the wood foundation.

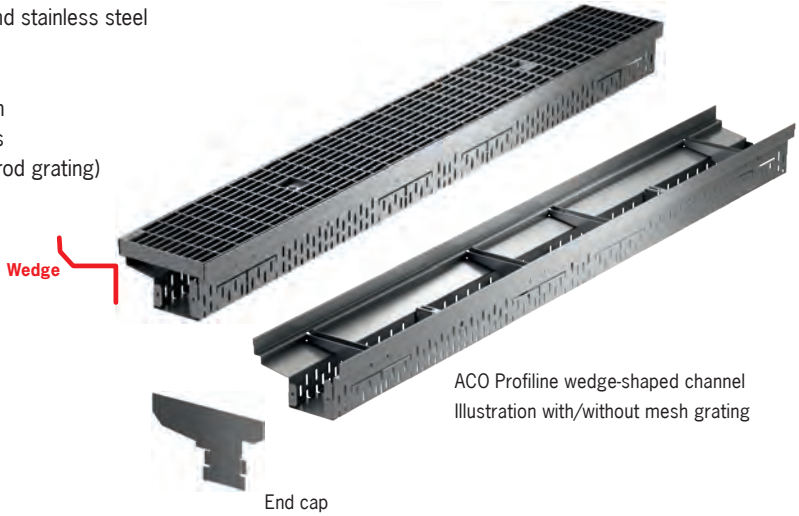


Additional gravel ledge

ACO wedge-shaped channel a precise fit in front of façade or door connections without additional gravel ledges

System

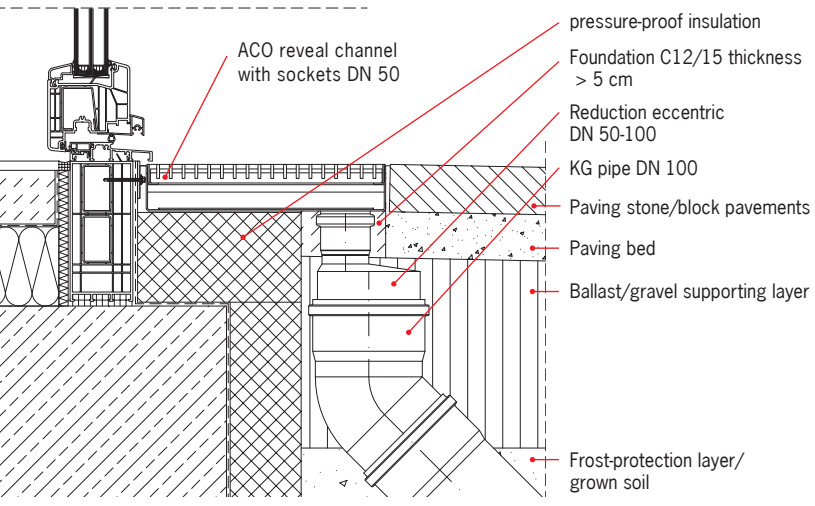
Material:	Galvanised steel and stainless steel
Width:	13 cm
Overall height:	7.5 cm
Overall construction length:	50 cm and 100 cm
Cover grating:	all Profiline gratings (except crosswise rod grating)
Accessory:	end cap



ACO Profiline wedge-shaped channel
Illustration with/without mesh grating

For assembly see page 43

System diagram of insulated cellars



Reveal channel grating

ACO mesh grating 30/10 mm, accessible on foot, accessible with wheelchair, no locking device
Material: galvanized steel, V2A (1.4301)

ACO Profiline longitudinal bar grating 3 x 15 mm, accessible on foot, accessible with wheel chair, no locking device
Material: galvanized steel, V2A (1.4301)

ACO reveal frames

Closed façade and terrace gutter in areas in contact with the ground

Drainage channels should always be positioned as closely as possible to upright components and/or profiles to collect the water on façades and door/window elements. Also, drainage channels need to be selected according to size, opening diameter of the cover and the channel body so they fit the respective situation.

ACO now has a custom solution, the ACO reveal channel, so that these requirements in the reveal area can be fulfilled. The channel is available in galvanised steel or stainless steel in lengths of up to 2.5 m and heights of at least 5 cm and/or maximum 20 cm. The closed, single unit customised design has a outlet socket DN 50 with a welded-in socket for connection of the drainage line. Cover gratings round off the drainage system that is a custom-made version to meet on-site specifications.

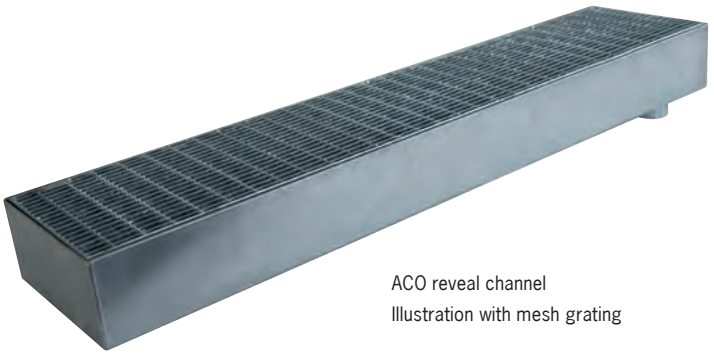
n the reveal area at the base of the building there are often difficulties trying to meet the sealing requirements according to DIN 18533 and the barrier-free requirements of the DIN 18040. Also, design aspects of the building often make it difficult to use standard drainage channels. For this reason ACO has included a custom-made version of the reveal frames in its façade channel program

Please ask us about your customised channel system.

The one-piece channel is manufactured to fit the reveal

System

Material:	Galvanised steel and stainless steel
Width:	20 cm – 50 cm
Building height:	5 cm – 20 cm
Length:	50 cm - 250 cm
Cover grating:	Mesh grating or Longitudinal rod grating (gratings over 1 m length are made in several parts)



ACO reveal channel
Illustration with mesh grating

Grating for Profiline X

Mesh grating 30/10 with innovative grate locking device

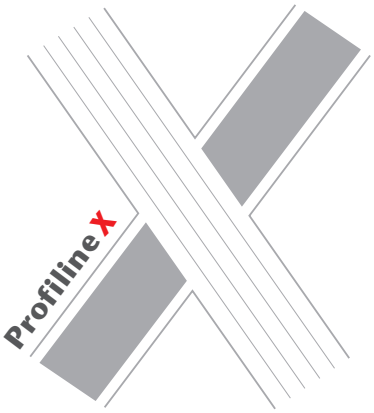
Longitudinal bar grating

Longitudinal bar grating

System

Material:	glass fibre reinforced plastic (PP-GF)
Width:	15.5 cm
Building height:	5 and 7.5 cm
Length:	100 cm
Cover grille:	can be combined with the Profiline grates in a stainless steel and galvanised version
Accessories:	front wall, branch channel, reveal drain element

Profiline X is easy to process, optimised for storage and transport and offers the ideal basis for high-quality gratings.



■ For technical details see page 24

■ For assembly see page 44

ACO Profiline X

The channel system made of glass fibre reinforced plastic (PP-GF)

Façade channels must be resistant to environmental influences and always be functional, at the same time they should impress optically. Building owners and developers also want a cost-effective solution.

ACO's new façade channel system takes all these requirements into account: With the ACO Profiline X, a further development of ACO Profiline made of metal, the channel is made of corrosion-resistant glass-fibre reinforced plastic (PP-GF), while the stainless steel cover ensures an attractive appearance. With the successful combination of PP-GF and stainless steel, ACO not only fulfils the requirements for changing environmental influences but also the wishes of many building owners and developers for channel covers made of stainless steel. An additional advantage for building owners and developers is that they can save on the expensive stainless steel substructure.

The Profiline X fulfils all the wishes for architects and planners with regards to aesthetics and qualitative, high-quality façade channels: You can find drainage solutions here, which perfectly suit the optical design for the façade. There are no restrictions on use.
Profiline X therefore provides the ideal basis for high-quality covers. It can be combined with all materials, corrosion from contact with the channel train is impossible. Both galvanised steel and stainless steel gratings form a durable, weather-resistant construction.

ACO Profiline X is particularly suitable for loose installation in roof garden, patio, terrace and balcony areas.
The connection height of 15 cm for structural waterproofing, which is specified by DIN 18531 and the Flat Roof Directive, can be reduced to 5 cm by utilising ACO Profiline X in the door area.
Shape and length stability are guaranteed by the material, design and construction.

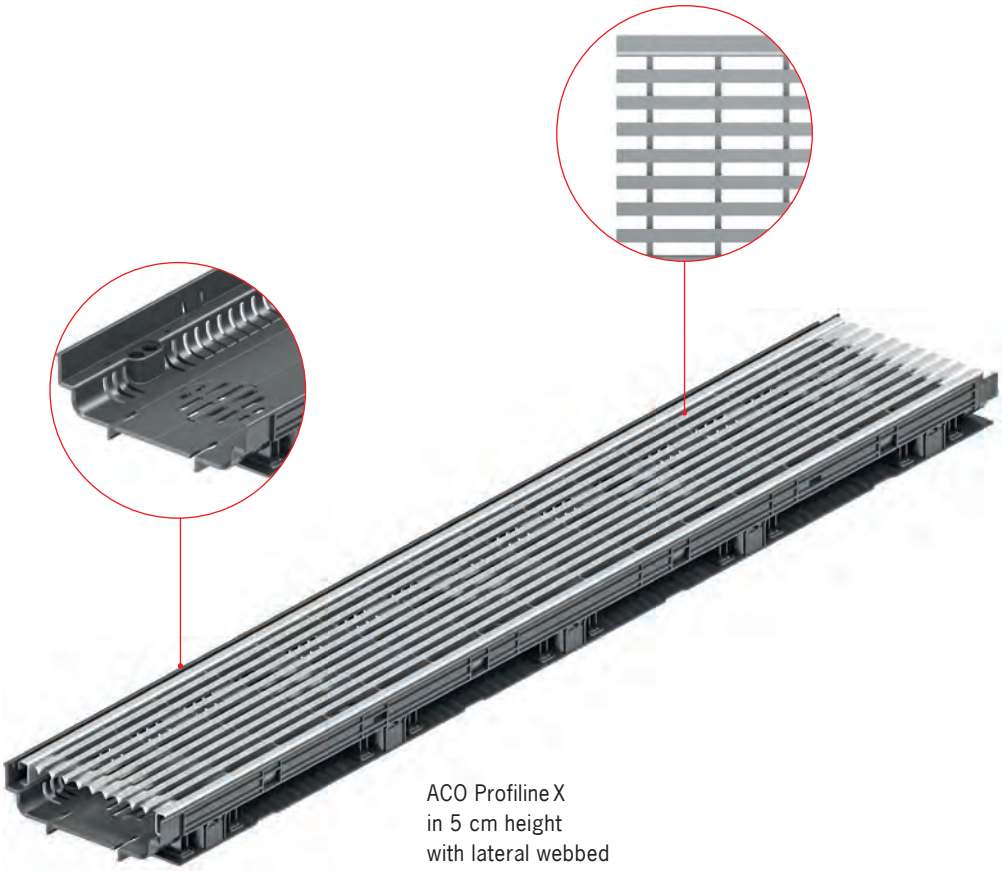
Made in Germany
- In-house development based on years of experience in the façade channel sector
- High-quality processing
- One-source production in Germany

Resistant
- corrosion resistant, no contact corrosion
- Durable and stable

Technical details

High-resistant material
- especially stable due to glass fibre-reinforcement (material PP-GF)
- Simple to shorten (no risk of corrosion)
- Thermal expansion is considered with the material composition and the new channel connection
- Anthracite colour with small, appealing channel edge

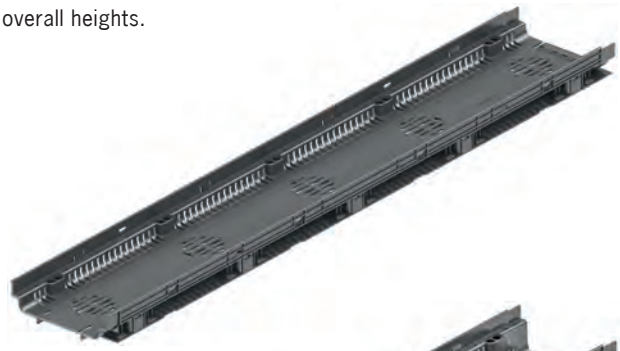
Suitable
- Good load distribution by means of large supporting surface areas
- Simple for working
- Optimised for storage and transport
- Removable direct connection options:
  - branch channel
  - reveal drain element
  - eccentric plug-in socket



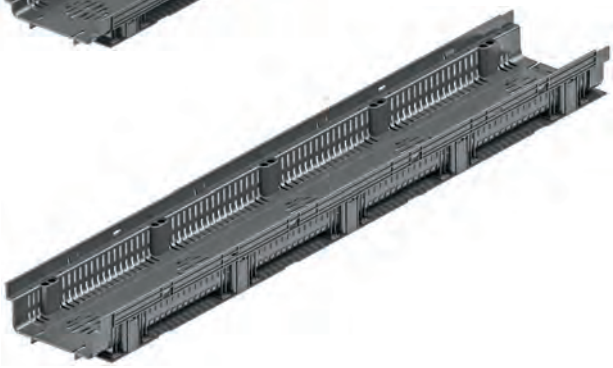
ACO Profiline X
in 5 cm height
with lateral webbed
grating

Overall heights

Profiline X is available in 5 and 7.5 cm fixed overall heights.
The construction width is 15.5 cm.



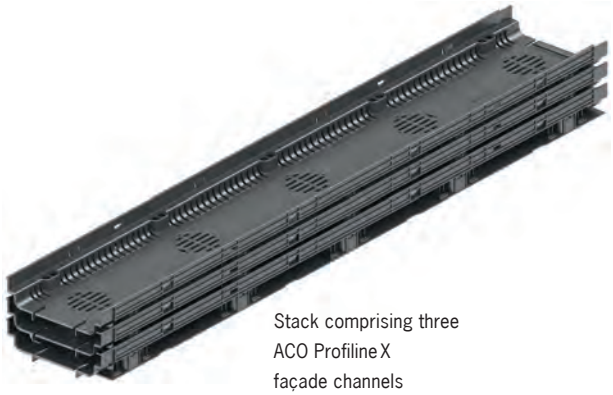
ACO ProfilineX
5 cm OH



ACO ProfilineX
7.5 cm OH

Durable and stackable

Aspects such as environmental protection and future compatibility are important in the construction industry. Long service life cycles of materials have a sustainable effect on buildings and the environment. The Profiline X is characterised not only by a particularly durable material but also by a timeless design form. It is also very easy to stack. This therefore reduces the space required for storage and transport.

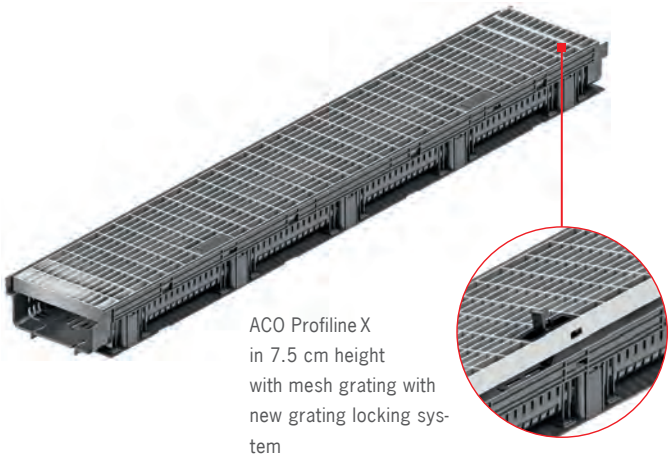


Stack comprising three
ACO Profiline X
façade channels

Novel grating locking system

Special attention has been paid to the locking of the mesh grating: Inserting the gratings in the façade area is now even easier. The one-sided grating locking system has been discreetly integrated into the ACO logo and has an integrated lift-out function.

- innovative grate centering through spacers



ACO Profiline X
in 7.5 cm height
with mesh grating with
new grating locking system

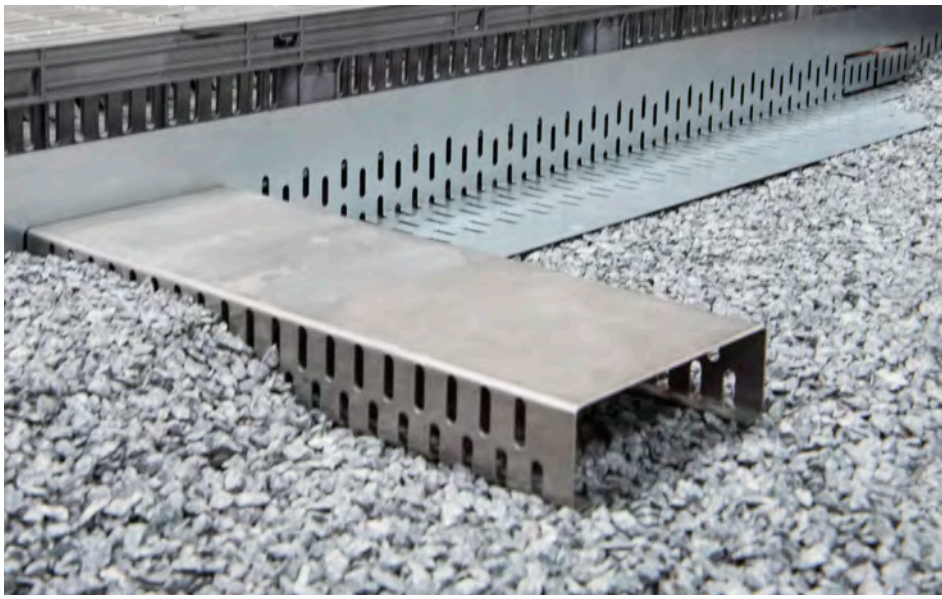
Height adjustment
The ACO Profiline X can be equipped with pre-mounted height adjusters at a later date or straight away. The fixed height of 5cm is converted into an adjusted height of 6-8cm and the fixed height of 7.5cm into an adjusted height of 8.5-12cm.
The adjuster is kept under tension so that the greatest height is always available from the beginning. For example, it starts with a height of 12 cm and can be fixed between 8 and 12 cm by simply pressing it down to the approximately desired height, the channel body can then be adjusted to the height with millimetre precision. Therefore it is also possible to tilt the channel system in both the longitudinal and lateral direction.

The ACO Profiline X can be equipped with two to five height adjusters. The number of height adjusters has a significant influence on the load-bearing capacity of the system.

! You can find more about height adjustment on page 52.

The height-adjustable end wall for shortened channel bodies
If the ACO Profiline X is shortened using the height adjuster, an adjustable end cap can be placed anywhere and take over the function of height adjuster.

Gravel ledge
The gravel ledge is placed loosely in front of the channel system and can be used for all adjustment ranges. In addition, a branch channel connection was taken into account.



Connection possibilities
The channel system has been designed in such a way that it can be connected directly in any installation case, as the branch channel enables direct or immediate connection to the drainage system.
The side wall will be opened and the **branch channel** is then connected directly on the channel.

ACO Profiline X
with branch channel

If the façade channel can be directly connected below, then there is a **plug-in spigot with** Ø 60 mm to DN 100 which can be placed eccentrically into the channel. Rotating it enables excellent positioning for the connection.

ACO Profiline X
with insert spigots

A direct connection to the drainage system can often only be realised on the channel side in the reveal area. The design enables the **reveal drain-off element** to be positioned on the side wall of the channel body. It is still able to be inspected after being built in and can easily be connected on a basic pipe system with DN 100.

ACO Profiline X
with reveal drain-off element

Greenline grating

Mesh grating 30/10

ACO Greenline 3.0

The functional version with fixed height

The ACO Greenline 3.0 is a simple but practical façade channel system with everything that is required in the standard. The system replaces the Greenline 2.0. The primary difference is the grating area where inserted gratings are now used. The mesh gratings with anti-rust protection have a fine grid structure which helps to avoid splashing water.

Like all ACO façade channels, the Greenline 3.0 also has a closed channel base to protect the sealing ring.
Integrated end walls mean that there are no additional costs for accessories.
An optimised channel connection and a perforation for the branch channel or connection element round off the system.

The façade channel system enables the implementation of barried-free door constructions in accordance with the flat roof guideline 12/2016, as there are gratings with a width of at least 150 mm.

System

Material:	steel, galvanised
Width:	10, 13, 15,5, 20 and 25 cm
Height:	fix 5 or 7.5 cm
Length:	50, 100 and 200 cm
Cover grating:	inset mesh grating 30x10 mm

ACO Greenline 3.0
with mesh grating 30x10 mm

- Fulfils the demands from DIN 18040
- Sealing according to DIN 18531/18533
- TÜV Süd certified

ACO Profiline Free

The channel system for barrier-free threshold systems PremiPlan® and PremiPlan® Plus from Profine

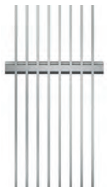
The demand for plan-related specifications for barrier-free transitions exists not only on the part of DIN 8531/18533 but also from the Flat Roof Directive. The planner still however faces many challenges during implementation with regard to the interfaces between the individual subjects regarding “door, waterproofing and drainage”. For this reason, the Profine, Alwitra and ACO companies have started a project to develop the so-called zero threshold.

As already demanded by AIBau in 2010, the focus was hereby placed on the design of details which are easy to execute by manual workers and/or pre-prepared safe connections for the sealing and waterproofing. The ACO Profiline Free drainage system, which was specially developed and tested for this purpose, is available as an open channel system for roofs, balconies, loggias and pergola walkways which are used for foot traffic in accordance with DIN 18531 and as a closed channel system for areas in contact with the ground in accordance with DIN 18533.

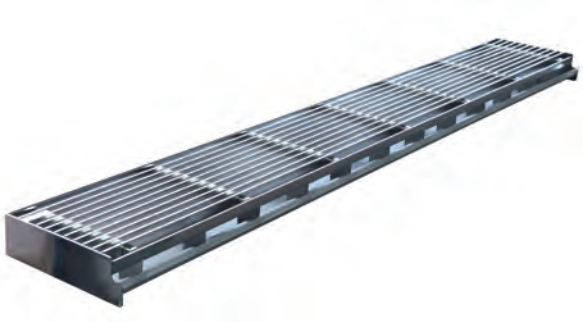
The first ever TÜV-tested, barrier-free transition for exterior doors, balconies, patios and terraces.
PremiPlan® – The premium system for maximum barrier-free access with floor-flush installation with zero millimetre upstand. Barrier-free accessibility and the transition between indoor and outdoor areas, combined with a high level of walking comfort, is one of the main current focal points in the field of comfortable and age-appropriate residential construction. The Profine Group, Alwitra Flachdach-Systeme GmbH and ACO Hochbau Vertrieb GmbH, as premium manufacturers in this field, have now developed the threshold-free transition especially for this purpose and have had it successfully tested by TÜV Süd for utilisation in accordance with DIN 18040 - Part 1+2 under the highest requirements.

Grating for Profiline X

Mesh grating 30/10



Longitudinal bar grating



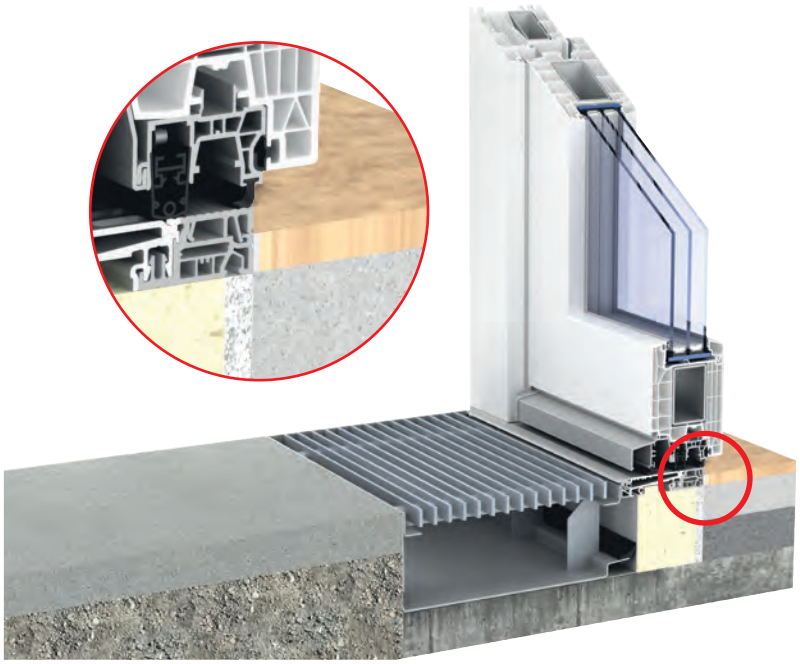
ACO Profiline Free, the zero threshold channel

Channel

Material:	Galvanised steel and stainless steel
Widths:	15 and 20 cm
Width:	10 cm
Length:	60 cm and 120 cm
Cover grating:	Mesh grid 30x10 mm and longitudinal bar grate

PremiPlan®

10 mm barrier-free threshold

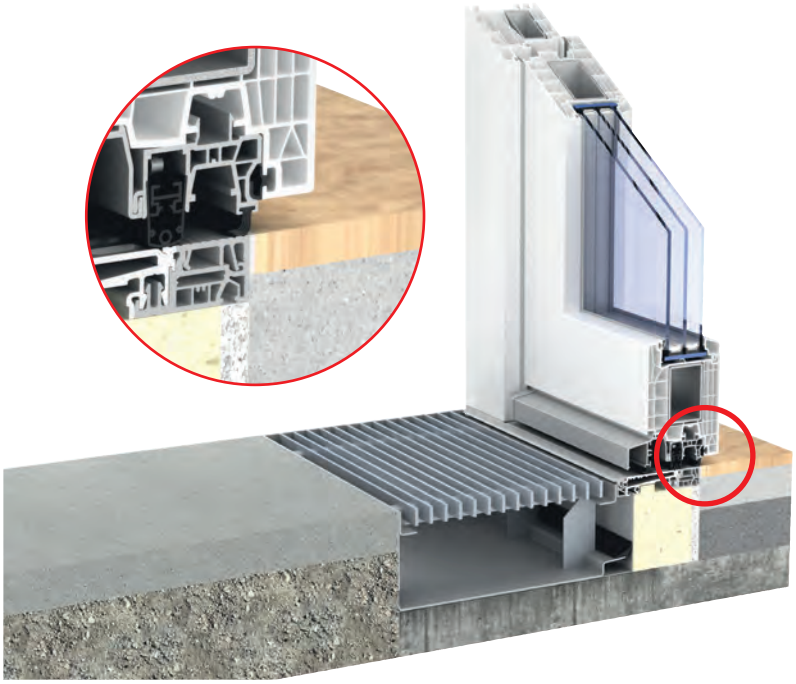


Implementing clever adaptation and utilising the previously tried and tested 20 mm threshold now enables all our entrance door, terrace and patio systems in the basic depths 76 and 88 to be transformed into barrier-free threshold solutions. In the case of door leaf profiles, the internal leaf overlaps are trimmed back and then fitted with a special rebate sealing strip.

Barrier-free i.e. threshold-free transitions from the living area to patio, terrace or balcony are now an integral part of the standard for upmarket residential design and construction. It must still however be ensured that no rainwater can penetrate into the building from the outside. PremiPlan® and PrimiPlan® Plus can be installed in the area of flat roofs or near the ground and also in areas that come into contact with the ground.

PremiPlan® Plus

0 mm with lowerable comfort seal



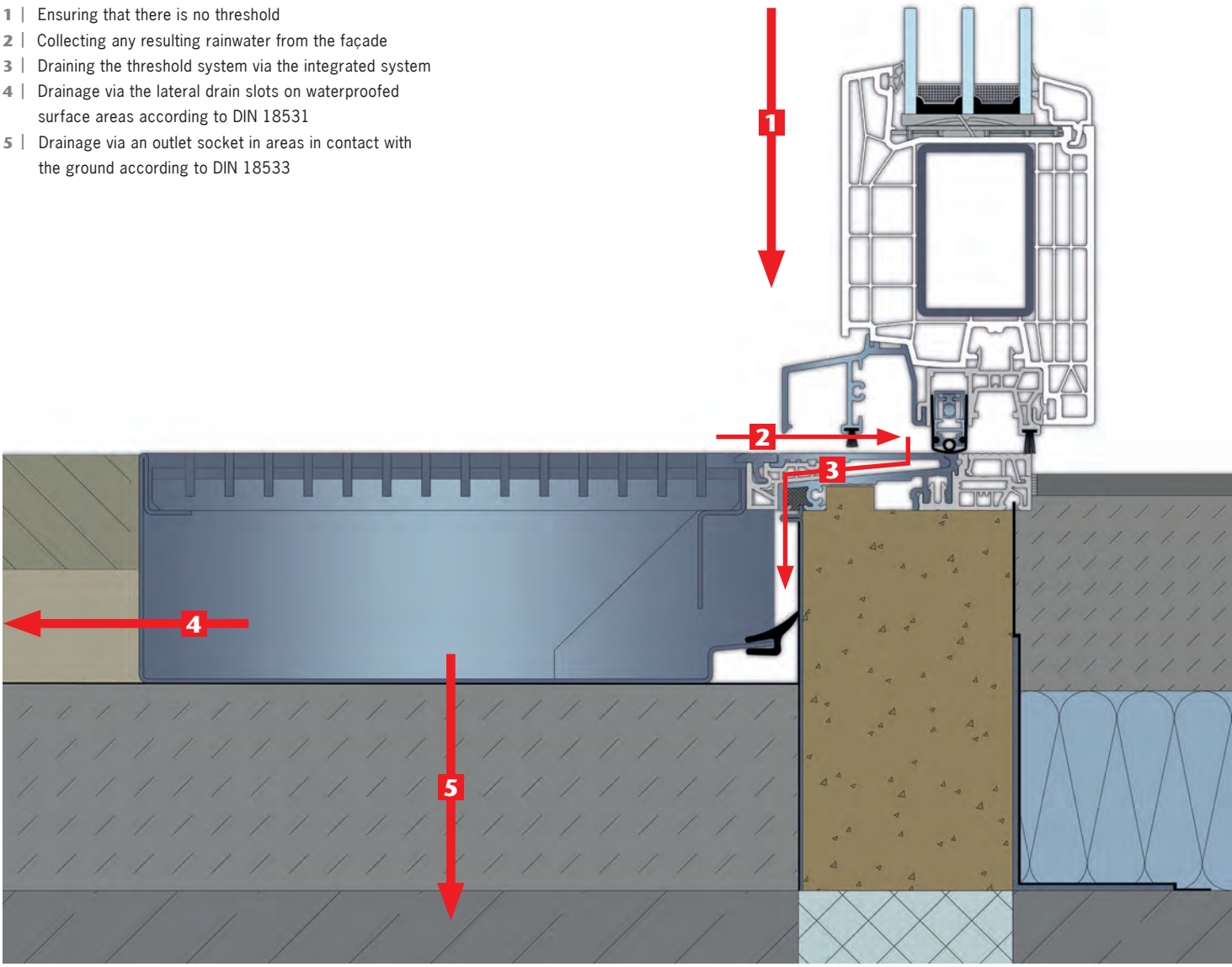
The premium threshold system for maximum barrier-free accessibility with high walking comfort due to the ground-level installation with zero millimetre upstand. A parallel lowerable floor seal is hereby a central component of a multi-stage, and continuous sealing concept, which therefore achieves maximum values by means of specially developed moulded parts. The modular design and construction of the system enables efficient production and assembly.

Both threshold systems can be utilised in the 88 MD window and front door systems and 76 rebate and centre seals for 1-leaf, inward opening elements. 2-leaf and outward opening elements are currently undergoing preliminary testing.

Technical details

Function

1 | Ensuring that there is no threshold
2 | Collecting any resulting rainwater from the façade
3 | Draining the threshold system via the integrated system
4 | Drainage via the lateral drain slots on waterproofed surface areas according to DIN 18531
5 | Drainage via an outlet socket in areas in contact with the ground according to DIN 18533



TÜV tested – Test report can be viewed at:
www.aco-hochbau.de/download/zertifikate

Profiline Free – Roof design

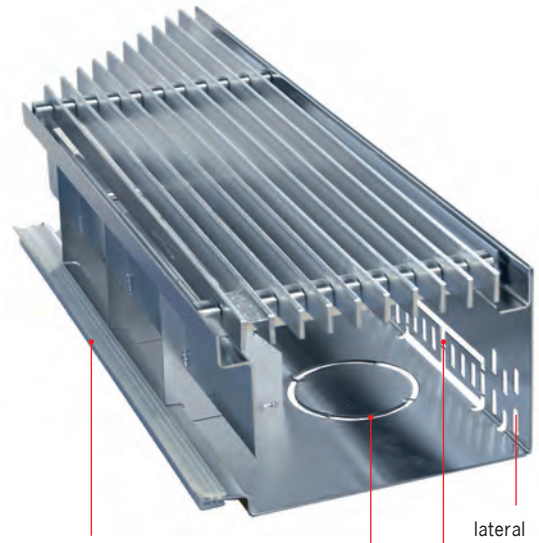
DIN 18531

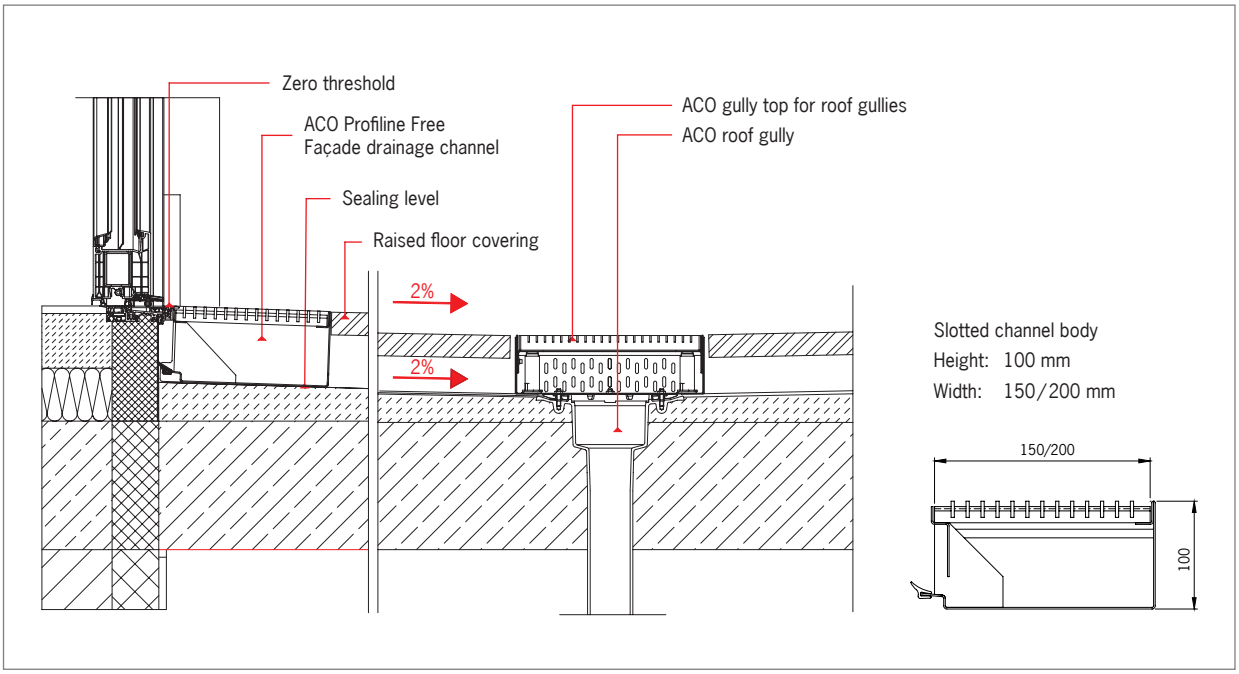
Made of hot-dip galvanised steel or stainless steel for the barrier-free door threshold area in accordance with DIN 18531 for inlaid gratings. Designed for patio, terrace and balcony doors for the PremiPlan® door threshold system.

Threshold connection with parallel-installed, continuous flexible seal for backflow-free connection to the threshold system. Open channel body with 4 mm drainage slots, branch duct connection and DN 100 connection possibility in the floor for balconies and roofs for foot traffic.

Material: galvanised steel or stainless steel V2A (1.301)
Widths: 15.5 cm and 20 cm
Overall construction height: 10 cm
Overall construction length: 60 cm and 120 cm

Water level slope, accessible as well as accessible with a wheelchair





Profiline Free – Contact with ground design

DIN 18533

Made of hot-dip galvanised steel or stainless steel for the barrier-free door threshold area in accordance with DIN 18533 for inlaid gratings. Designed for front entrance door and side entrance door for the PremiPlan® door sil system®.

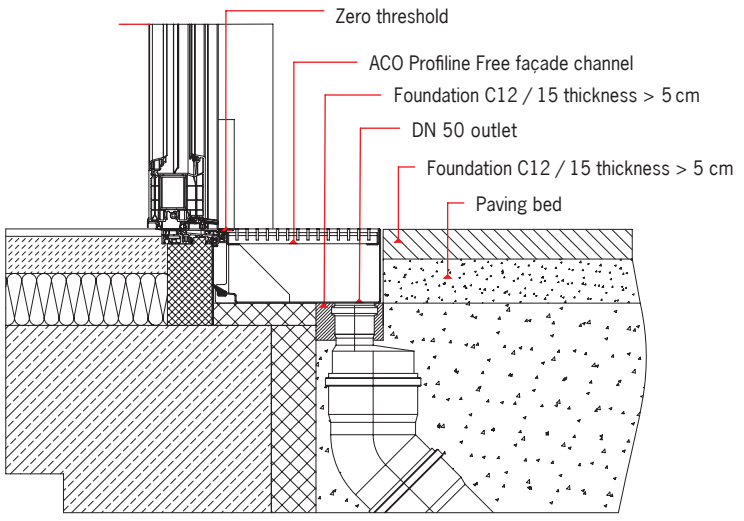
Threshold connection with parallel-installed, continuous flexible seal for backflow-free connection to the threshold system. DN 50 closed channel body with connection possibility in ground for front entrance door areas.

Material: galvanised steel or stainless steel V2A (1.301)
Widths: 15.5 cm and 20 cm
Overall construction height: 10 cm
Overall construction length: 60 cm and 120 cm

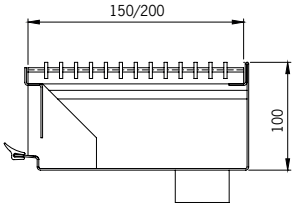
Water level slope, accessible as well as accessible with a wheelchair

Connection and drainage of the threshold system

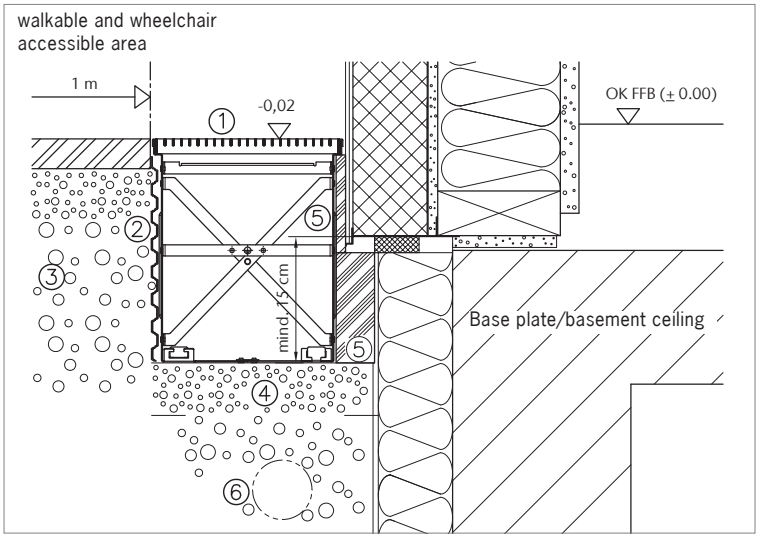
Connection DN 50



Channel body with DN 50 socket
Height: 100 mm
Width: 150 / 200 mm



Installation example for the base



1. ACO base strip W/H 250/300 cm
2. Drainage/dirt mat (lateral drainage slots only at the bottom)
3. leachable subsoil/substrate for paving stone or bock pavements
4. a foundation with sufficient load-bearing capacity
5. Local spacers (e.g. platestrip) in the area of all channel reinforcements (crosses)
6. Drainage

ACO Profiline base channel

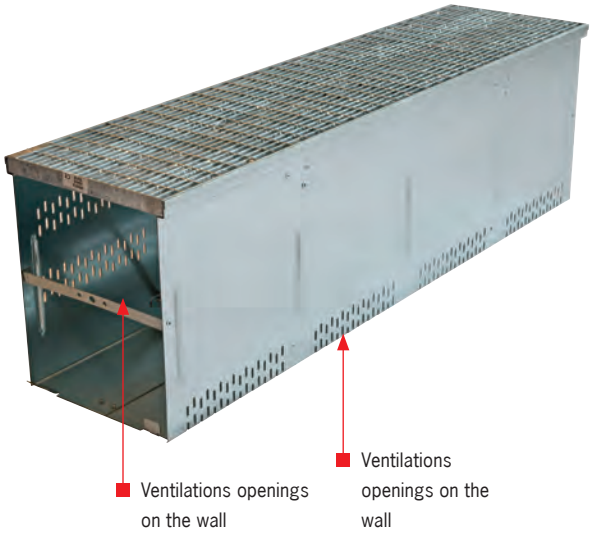
Barrier-free façade drainage

The ACO base channel is primarily used to create a barrier-free transition in accordance with DIN 68800-2 "Wood preservation - Preventive structural measures in building construction".
In contrast to façade and terrace channels with open side walls, the base channel can be used especially for the height-reduced outlet area in accordance with DIN 68800-2. Its task is to separate the (dry) base from the (damp) soil and to absorb all the rainwater running off the façade, thus supplementing or supporting the drainage system.

The channel body with its lateral drainage and ventilation openings offers the function of a gravel trap including integrated grating support for the inserted drainage grate or grating. The mesh grating used (MW 30/10 mm) provides the best possible splash protection for the base area.

System

Material:	Galvanised steel or stainless steel
Width:	25 cm
Overall height:	fixed 30 cm
Length:	50 cm and 100 cm
Cover grating cover:	inset mesh grating 30x10 mm




ACO

Assembly instructions

Content

askACO

Service offer for the planner

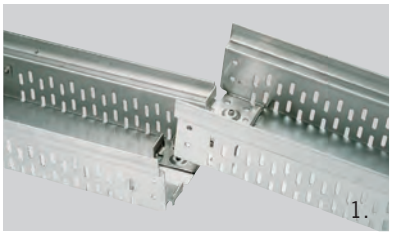
Please contact the application technology team at ACO free-of-charge if you have any detail questions, if you require an exact hydraulic calculation, parts lists, article descriptions, installation plans or personal support at the construction site.

Information about our products, public tender texts (in the formats GAEB, HTML, TEXT, PDF, XML, DOC and ÖNORM), technical drawings (in the formats DXF and PDF) and installation manuals are available online in the service section at:
www.aco-hochbau.de

Direct access to the component:
www.fassadenrinne.de

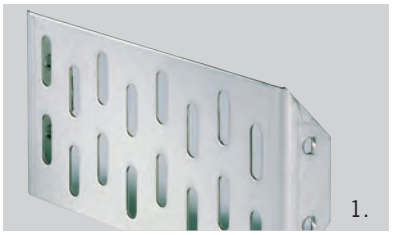
ACO Profiline fixed height

1. Connection of the channel elements

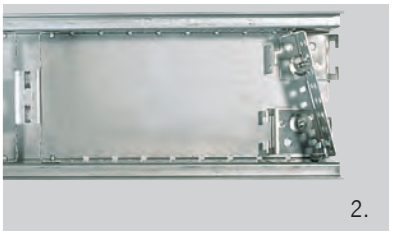


- Picture 1: The plug system for connecting the channels is designed so that a channel body lies flat and the following channel body is attached from top to bottom
- Picture 2: A firm connection between the channel bodies is created without screws or tools.
  The continuously closed channel base and the on-site protection layer guarantee that the sensitive rook skin below is not damaged

2. Attachment of end caps



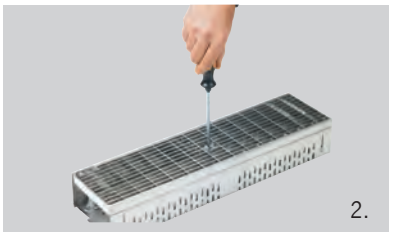
- Picture 1: The end cap must be mounted entirely screwless. It has two punched grooves for this on both sides



- Picture 2: The end cap must be mounted from inside to outside. Here, one side of the end cap with the punched recesses is placed into the designated boreholes. The other side is pressed outward until it clicks into the boreholes

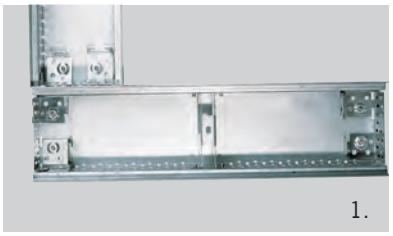
- Picture 3: completely assembled front wall

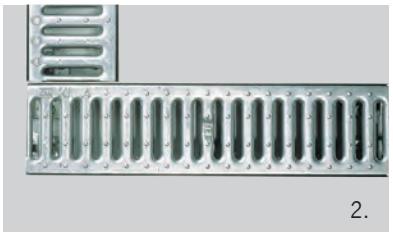
3. Grating locking device



- Picture 1: All channel elements have channel lock prepared ex-works.
- Picture 2: The grating lock is simply activated by turning it a quarter turn to the right or left using a slit screwdriver.

4. Corner design

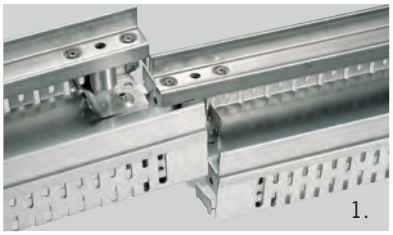


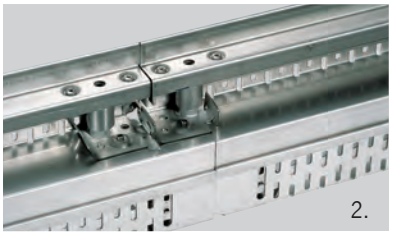


- Picture 1: End caps need to be used to create corners on both channel elements.
- Picture 2: A clean corner is created by joining at a 90° angle. Stabilisation is achieved by processing the adjoining coating

ACO Profiline height-adjustable

1. Connection of the channel elements



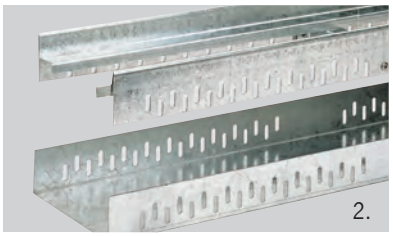


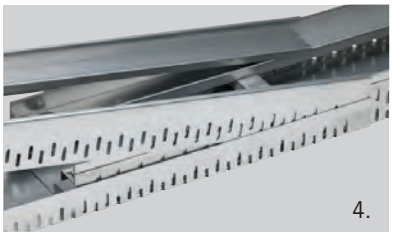
- Picture 1: The plug system for connecting the channels is designed so that a channel body lies flat and the following channel body is attached from top to bottom
- Picture 2: A firm connection between the channel bodies is created without screws and tools. The continuously closed channel base and the on-site protection layer guarantee that the sensitive rook skin below is not damaged.

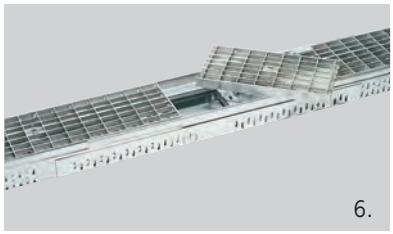
2. Attachment of end caps

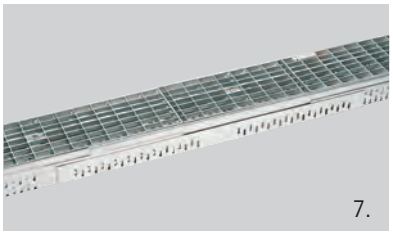
- Picture 1: The end cap adapts to the respective building height.
- Picture 2: The end cap is inserted into the recesses at the channel end with the pronounced tabs.

3. Assembly of the centre compensation element



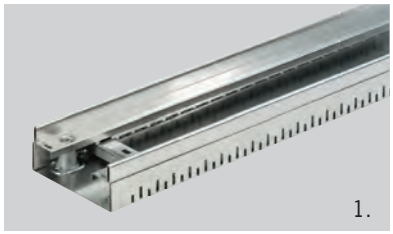


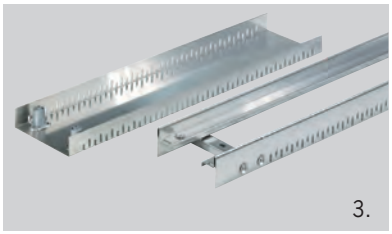


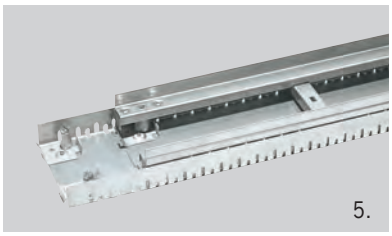


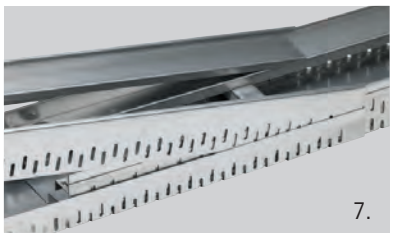
- Picture 1: The centre compensation element also allows free length adjustment of 5 to 50 cm between at least two channel elements.
- Picture 2: The soil and frame are completely separated when assembling the compensation element.
- Picture 3: Place the two channel elements in the soil of the compensation element and create the required compensation length.
- Picture 4: The frame of the compensation element is placed over the frame of the channel element
- Picture 5-7: The cover grating length is adjusted and can also be locked in the compensation element.

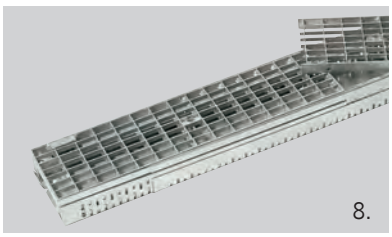
4. Assembly of the end compensation element

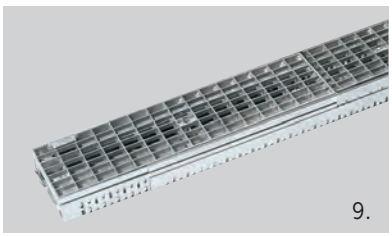










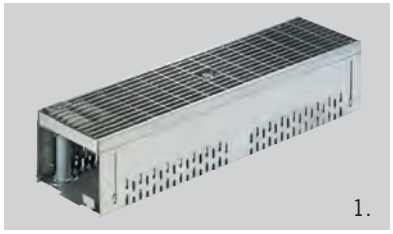


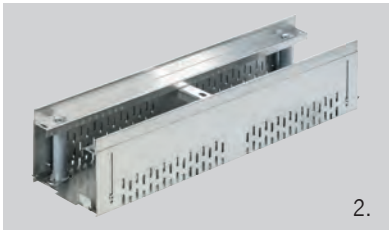
- Picture 1: The end compensation element also allows free length adjustment of 10 to 55 cm behind or in front of a channel element.

- Picture 2-3: The soil and frame are completely separated when assembling the compensation element.
- Picture 4–5: Place the channel element in the soil of the compensation element and create the required compensation length.

- Picture 6-7: The frame of the compensation element is placed over the frame of the channel element.
- Image 8-9: The cover grating length is adjusted and can also be locked in the compensation element.

5. The height adjustment

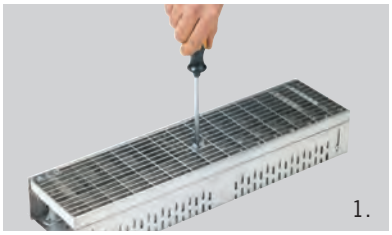




Picture 1 -2: The height adjustment is located below the cover grating at both ends of the channel and can be easily reached at any time by moving the grating.

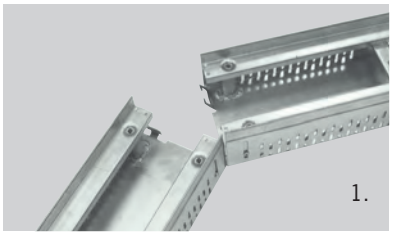
- Picture 3: The building height can be freely adjusted using a slit screwdriver or a 5 mm inner hex wrench.

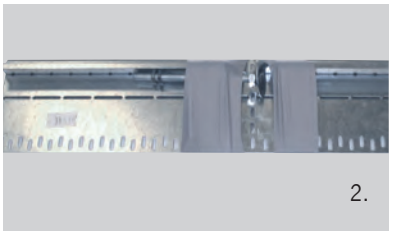
6. The grating stop

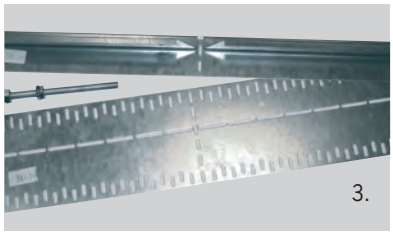


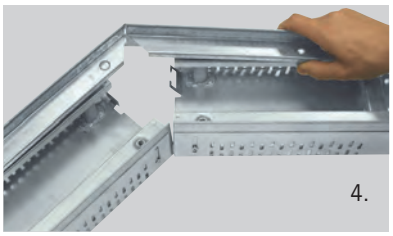
- Picture 1: The grating lock is simply activated by turning it a quarter turn to the right or left using a slit screwdriver.

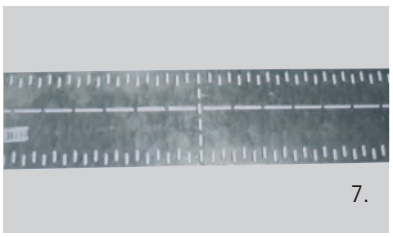
7. Corner creation with variable corner element 0-90° (does not fit on the compensation element)

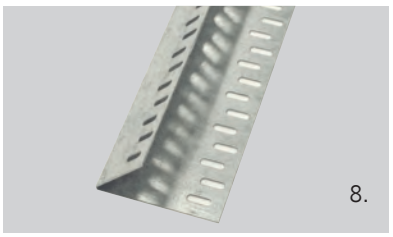


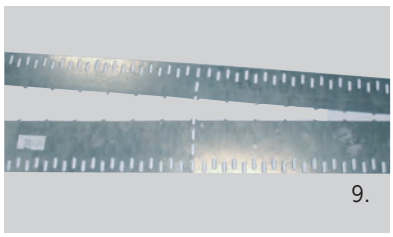


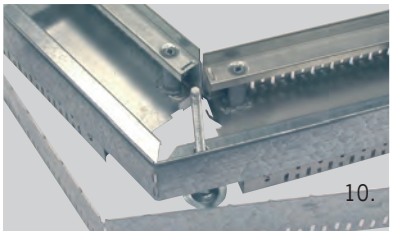


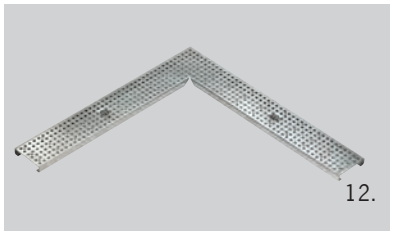


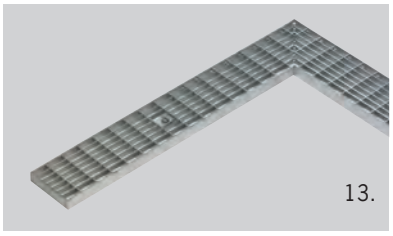


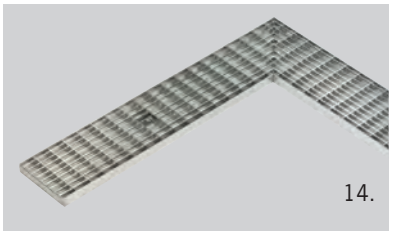










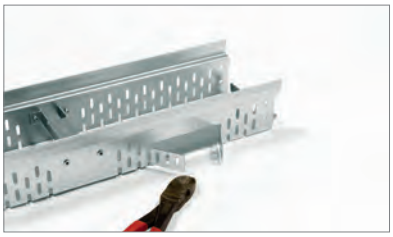


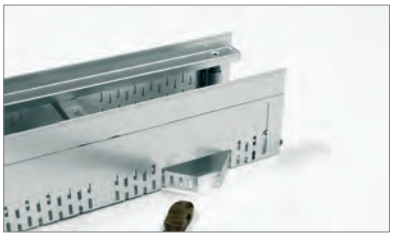
- Picture 1: The channel elements are placed together at the desired angle
- Picture 2-3: The adhesive tape in the packaging can be easily removed without residues.
- Picture 4: The variable corner element is adapted to the angle and placed over the frame of the channel element.
- Picture 5-6: The threaded rod is affixed with nuts below the corner element and shorted to the required height.
- Picture 7-8: Separation of the gravel ledge by overbending the perforation
- Picture 9: The gravel ledge (suitable for all building heights) is adapted to the building height of the channel element.
- Picture 10–11: The gravel ledge is set at the right angle and then placed loosely on the channel element.
- Picture 12-14: The cover gratings are locally cut to the required angle on site.

ACO Profiline with direct or indirect connection to the drainage

1. Preparation for attaching the branch canal

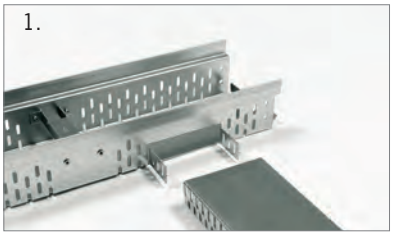
The side wall is simply opened with wire cutters. A cut in the middle is enough; both side parts are simply folded outward and serve to affix the branch channel.

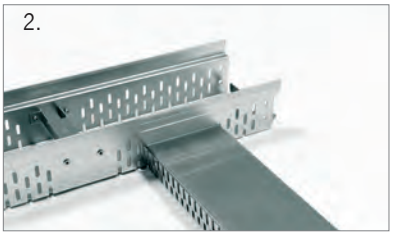


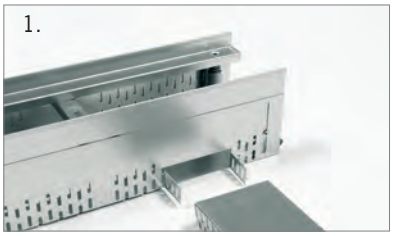


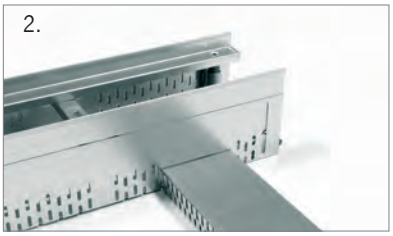
2. Branch channel elements - placement of the branch channel

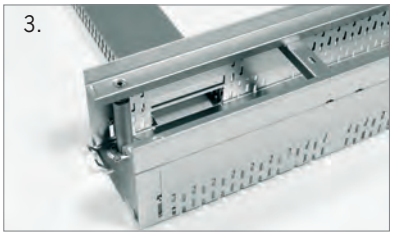
A branch channel lies in the drainage layer. It guarantees secure water flow to the gully. The branch channel connection elements fulfil the requirement for direct, intermediate connection to a drainage system. The elements are each 0.5 m long and can be inserted at the corresponding point in the channel train. The other end of the branch channel ends on the gully top for roof gullies that also needs to be opened





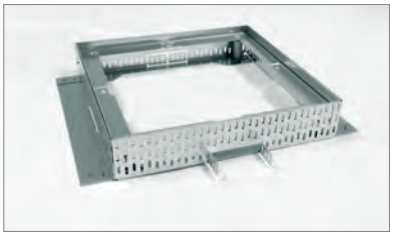
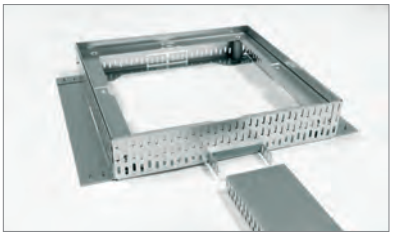
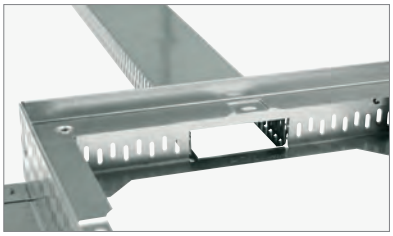






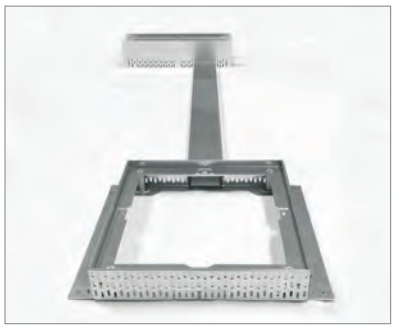
3. Branch channel connection on the gully top for roof gullies

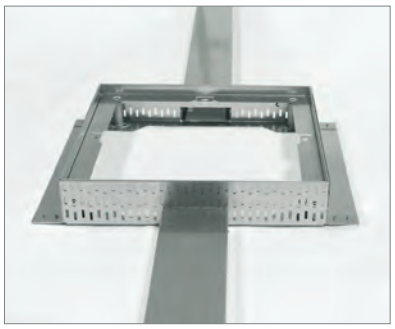
The branch channel connection elements fulfil the requirement for direct and/or indirect connection to a drainage system. The side wall is simply opened with wire cutters. A cut is the middle is enough. Both side parts are simply folded outward and serve to affix the branch channel in position during processing.

4. Maintenance and cleaning of the branch channels

Regular cleaning is necessary when the branch channel is connected directly, i.e. when the channel body and the gully top for roof gullies are opened.
It is recommended installing a cleaning shaft approx. every 4 m; this can also be the gully top for the roof gullies.
Actual rinsing can be carried out with a simple garden hose.

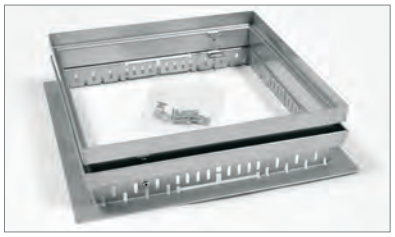




5. Gully top for roof gullies with locked mesh gratings

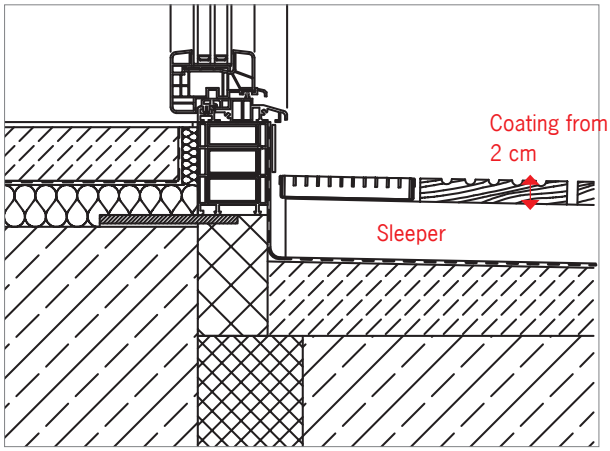
The two supplied clamps are pushed over two of the opposite grooves (depending on the position of the grating) with the flat side facing upwards.

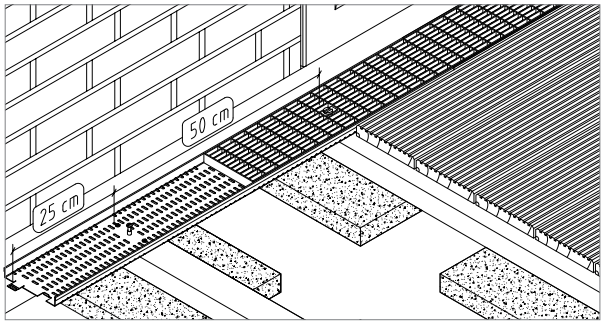
After inserting the grating, the holding clamps are screwed to the gully top through the mesh using the supplied M5 screw. Locking device of the gully tops at a fixed building height and the extension elements functions in the same way.

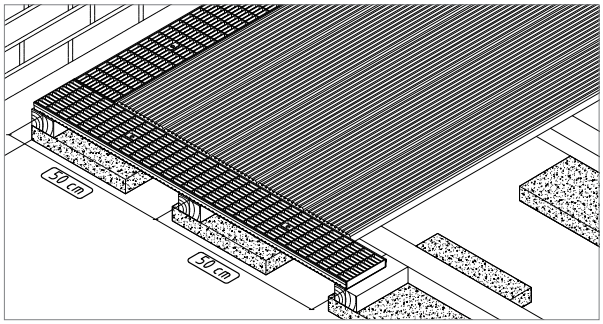


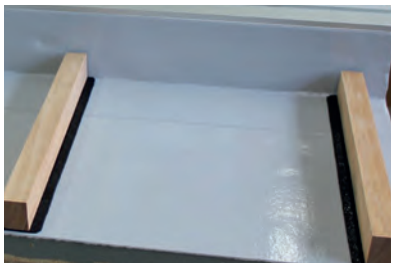
ACO Profiline wood terrace channel

ACO Profiline has been specially adapted to the requirements of wood terraces: With a overall height of 2 cm, the system fits into any plank thickness. The channel train joint lies directly there at a distance of 50 cm from the foundation. The maximum sleeper distance is 70 cm The drainage slots are used for attachment near the sleeper.









Instalment of sleeper onto the sealing ring. Recommended distance for the channel body is 50 cm.

Fitting of the wood terrace channel

If necessary, place material below the channel body

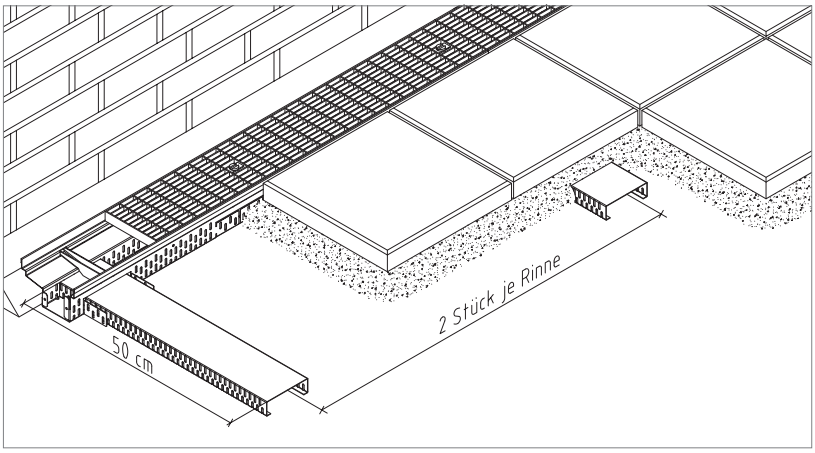
The channel body is screwed into the channel base the 4 mm drainage slots in the bottom of the channel

Check the installation height

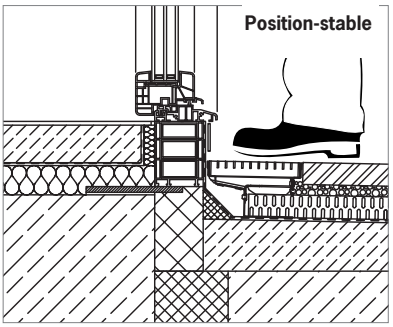
ACO Profiline wedge-shaped channel

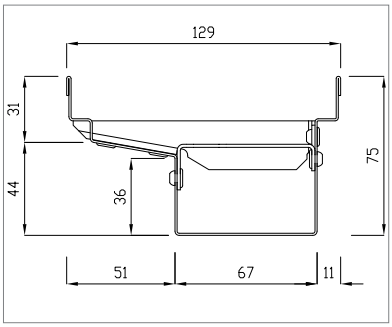
The possibility of inserting the branch channel into the channel body prevents the channel tipping over. This development solves a problem frequently encountered in practice.

The channel can be connected with the coating by opening the side wall and inserting the branch channel so that it does not tilt despite of the slope. Up to 4 branch channels can be used. It is recommended using min. 2
branch channels with a length of 50 cm and a counter-bearing of a e.g. 40 x 40 board. Alternatively, the branch channel can be affixed elsewhere, e.g. By screwing it to the wood foundation.



Inserting the branch channel into the channel body means that the block pavement position acts as a counter-bearing so that the channel lies stably despite the wedge

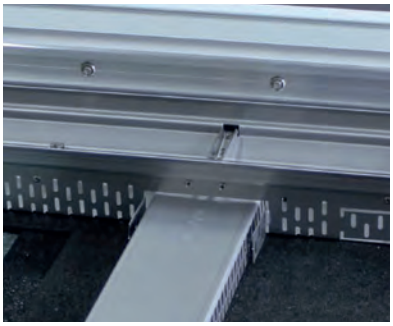




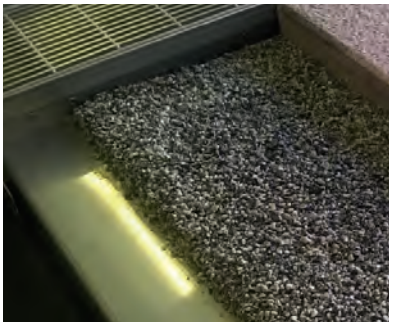
Connection of a bitumen-based sealing ring with a wedge

Opening the branch channel connection

Placement of the channel with the overhand to the connection area



Insertion of the branch channel into the channel. It is recommended using min. 2 branch channels with a length of 50 cm per metre of channel



Inserting the gavel and subsequent installation the block pavement

ACO Profiline X - glass fibre reinforced plastic channel

1. Assembling the cover grating with locking device

The grating is inserted on one side so that it can also be easily pushed under a façade element. The previously raised locking devices are then pressed downwards. Simply press the "A" on the ACO logo to unlock the grating and remove it. The grating can be simultaneously pressed out of the frame by placing the locking device vertically.

2. Wide range of connection options

The channel system has been designed in such a way that it can be connected directly in any installation case, as the branch channel enables direct or immediate connection to the drainage system.
The side wall will be opened and the **branch channel** is then connected directly on the channel.

ACO Profiline X
with branch channel

If the façade channel can be directly connected below, then there is a **plug-in spigot with** Ø 60 mm to DN 100 which can be placed eccentrically into the channel. Rotating it enables excellent positioning for the connection.

ACO Profiline X
with insert spigots

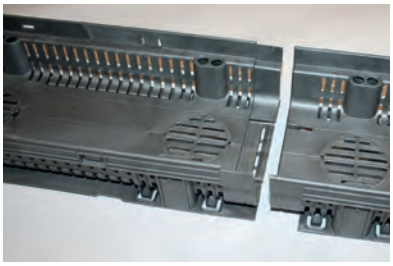
A direct connection to the drainage system can often only be realised on the channel side in the reveal area. The design enables the **reveal drain-off element** to be positioned on the side wall of the channel body. It is still able to be inspected after being built in and can easily be connected on a basic pipe system with DN 100.

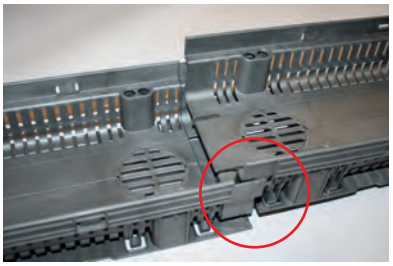
ACO Profiline X
with reveal drain-off element

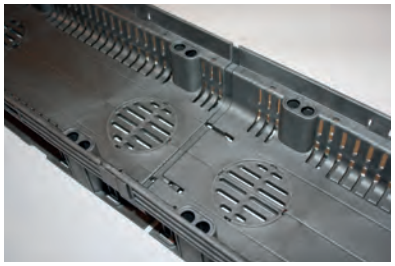
3. Channel connections

The second channel element is snapped in from above for the channel connection. The channel elements are then connected and have the possibility to move in the longitudinal direction. This thereby serves for taking the thermal linear expansion into account in the case of longer channel trains.

IMPORTANT! Always shorten the channel at the start of the channel section by 1 cm before laying the first channel element – refer to cutting guide ○







4. Shortening the channel body

The channel body can be shortened on preferred positions

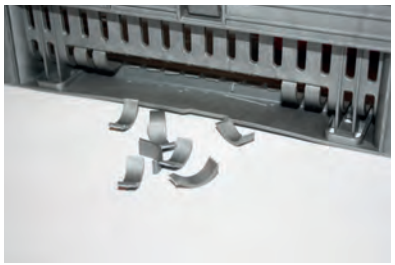
The end cap also fits on the shortened channel body by simply inserting it.

Completely assembled end cap

5. Assembling the branch channel

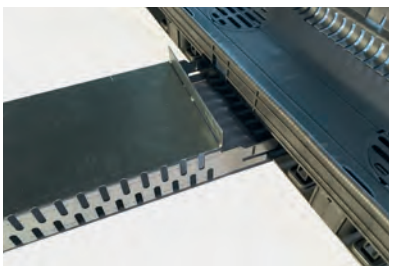
Transfer the branch channel width

Cut through the ribs from above
Press the ribs outwards

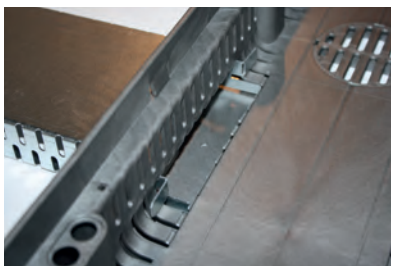


Break out the ribs

Push in the branch channel

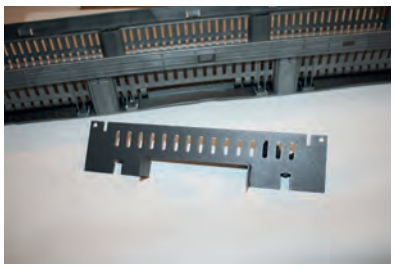


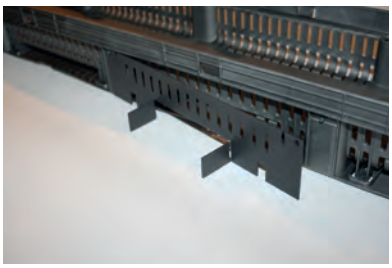
Branch channel for channel, height 5 cm, fold upwards on the perforation



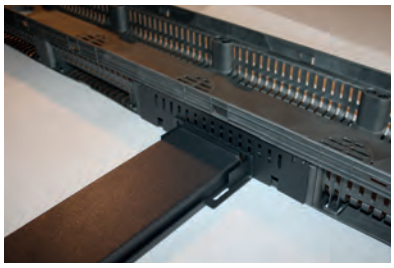
Kink both straps

6. Assembling the connection for the reveal drain-off element


Connection element


Insert the connection element on the tenons


The channel element must be opened from inside (also refer to branch channel connection)


Position the reveal drain-off element

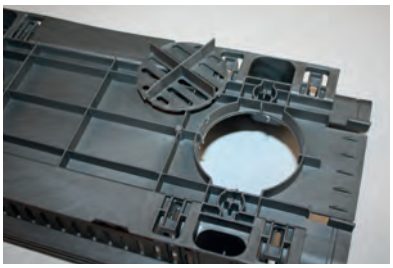

Fold over the straps for fixing

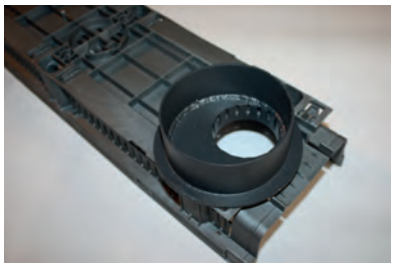

KG pipe DN 100 can be connected

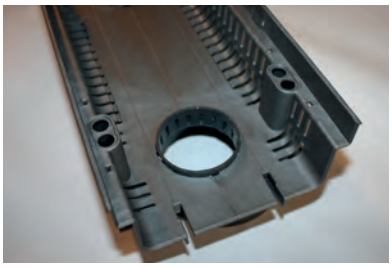
7. Assembling the insertion spigots


Cut through the four ribs from below

Knock out the area for the insert spigots

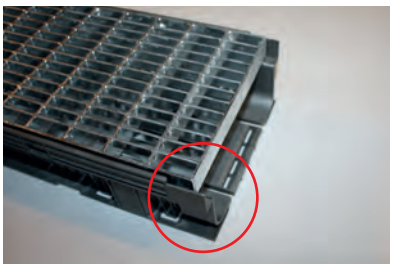

Remove and dispose of the unit


Position the eccentric insert spigots The position can be altered by rotating here


Insert spigots

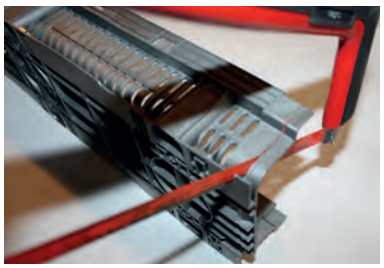

Connecting the KG-pipe DN 100

8. Assembling the end cap



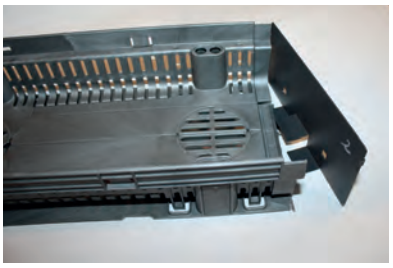
The channel element is respectively 1cm longer due to the overlaps on the ends

This 1cm must be separated before positioning the end cap.



Shorten the channel end in the side area

Shorten the channel end in the ground area



Position the end cap

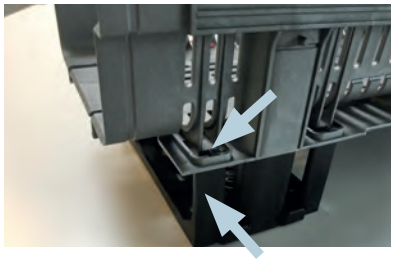
IMPORTANT! Always shorten the channel at the start of the channel section by 1 cm before laying the first channel element – refer to cutting guide

9. Assembly height adjustment

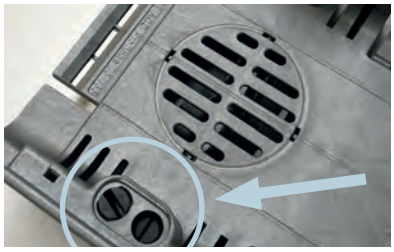
The ACO Profiline X can be equipped with pre-mounted height adjusters at a later date or straight away. The fixed height of 5cm is converted into an adjusted height of 6-8cm and the fixed height of 7.5cm into an adjusted height of 8.5-12cm.
The adjuster is kept under tension so that the greatest height is always available from the beginning. For example, it starts with a height of 12 cm and can be fixed between 8 and 12 cm by simply pressing it down to the approximately desired height, the channel body can then be adjusted to the height with millimetre precision. Therefore it is also possible to tilt the channel system in both the longitudinal and lateral direction.

Complete adjustment unit
ATTENTION: Do not change

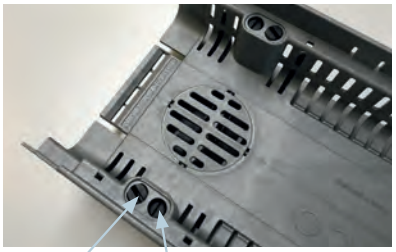
Position the springs and press the adjustment unit into the corresponding retainers.

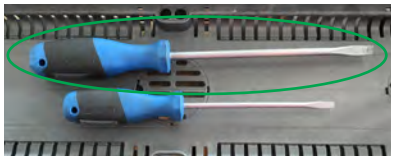


The adjustment unit must engage here, if necessary press it in a little at the side.



Now the Profiline X is placed on the adjustment unit and pressed in from above until the adjustment unit audibly engages. Now the height adjustment is fully functional.





Tip:

Use the correct tool! The screwdriver should go over the **entire** width of the slot.

The ACO Profiline X can be equipped with two to five height adjusters. The number of height adjusters has a significant influence on the load-bearing capacity of the system.

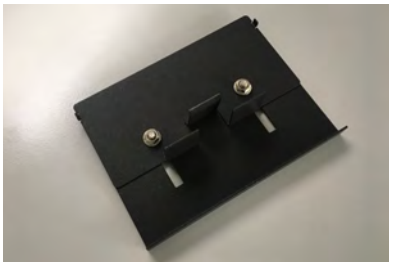
The ACO Profiline X with **two** height adjusters is not accessible

The ACO Profiline X with **three** height adjusters is accessible on foot and with wheelchairs

The ACO Profiline X with **five** heigh adjusters is suitable for
increased load requirements

10. Mounting height-adjustable end wall for shortened channel bodies

If the ACO Profiline X is shortened using the height adjuster, an adjustable end cap can be placed anywhere and take over the function of height adjuster.



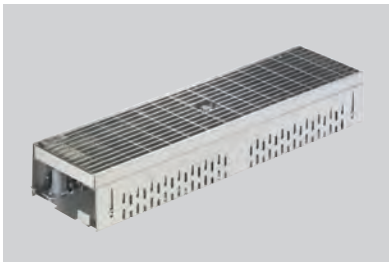
11. Gravel ledge installation

The gravel ledge is placed loosely in front of the channel system and can be used for all adjustment ranges. In addition, a branch channel connection was taken into account.

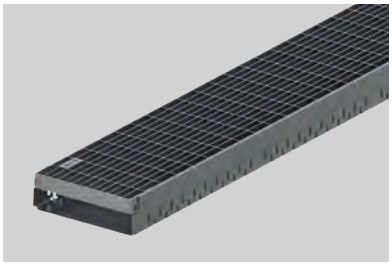
Product data sheet

ACO Profiline, ACO Greenline 3.0

ACO façade and terrace channels serve to meet the requirements of the valid directives (DIN 18531, Flat Roof Directive, FLL) and prevent water penetration as a result of the wind load or collection in front of particularly endangered areas. The surface water and suspended substances are discharged via the lateral drainage slots into branch channels that lead to the gullies, in the free area below block pavements on raised floors/sacks of mortar and/or into the drainage layer.
A branch channel is a hollow body with lateral drainage slots. Its front side is attached to the drainage slots of the channel body and the gully top for roof gullies, and lies within the drainage layer. Therefore, it connects the channel body and the gully top, and forms a defined drainage channel (direct connection to the drainage system).
The gully tops for roof gullies on terrace surfaces must be arranged across the roof gullies as inspection shafts.



ACO Profiline



ACO Greenline 3.0

ACO gulley top for roof gullies

Scope
- Façades
- Terraces
- Balconies
- Porches
- Green roofs
- Roof gardens
- Barrier-free construction

Carrying capacity
- Accessible on foot
- Accessible for wheelchairs

Materials
- Steel, galvanised
- Stainless steel 1.4301 (V2A)

Channel connections
- Tongue-and-groove system (ACO Profiline)
- Channel connector (ACO Greenline 3.0)

grating stop
- Stopping of the grating thanks to system that is pre-assembled at our works
- ACO Greenline 3.0 and gully tops without grating stop

Channel elements
- Close channel base
- with integrated gravel ledge

Cleaning
- rinse with water
- with brush/broom
- with trowel

Slope
- without slope

Combination of materials
In principle, outdoor area combinations of stainless steel and non-noble materials (e.g. stainless steel channels and cast or galvanised gratings) should be avoided due to the high risk of contact corrosion. When elements are formed, the non-noble material can corrode much more quickly. In addition, the passivity of the stainless steel can become lost, in particular if reducing corroding agents are also added (e.g. de-icing salt).

Corrosion by foreign atoms
Natural cleaning by means of surface water is significantly reduced primarily in covered areas. This means that foreign atoms that are deposited from the environment (e.g. from brake disks, dust, sand etc.) are not removed by the surface water.
These foreign atoms can cause corrosion. This is not substantial rust of the stainless steel material, instead less noble foreign atoms from the environment dissolve on the surface. Regular maintenance and cleaning intervals contribute to significantly reducing extraneous rust corrosion.

General information

Cutting the channel body
It is not recommended cutting the channel body to adjust the length because this means that the overall system loses its functionality near the height adjustment.
The ACO Profiline programme offers the functional alternative of the compensation element here.

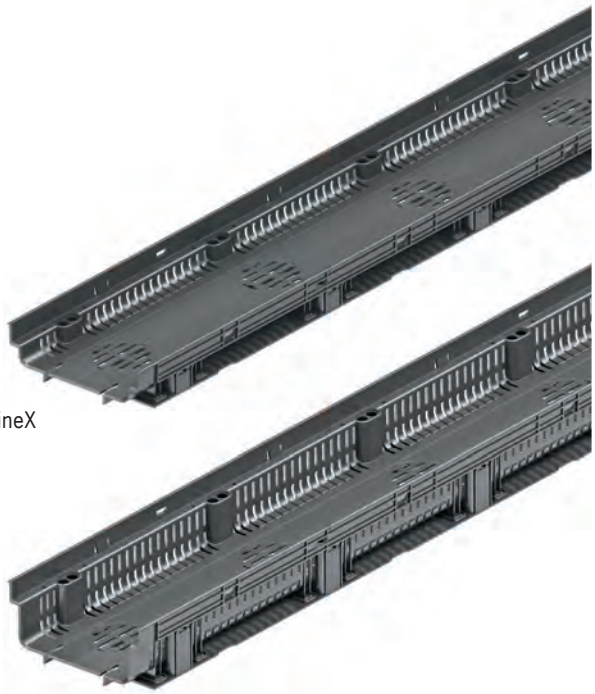
Further treatment of interfaces in the stainless steel area
The interfaces of cut stainless steel parts must be retreated.
Corrosion is prevented when the interfaces are brushes or etched.

Further treatment of interfaces in the galvanised area according to EN ISO 1461 Paragraph 6.3 reworking
The sum of the areas without a coating that need to be reworked may not exceed 0.5 % of the total surface of the single component. A single area without a coating may not exceed 10 cm^2.
The reworking must involve thermal spraying with zinc or a suitable zinc duct coat within the practical limits of these systems.
It is also possible to use zinc-based solders. The contractor or end user must be informed about the applied reworking procedure.
The reworking must also include the removal of impurities and necessary cleaning and surface preparation of the damaged areas to ensure adhesion.

Product data sheet

ACO Profiline X

ACO façade and terrace channels serve to meet the requirements of the valid directives (DIN 18531, Flat Roof Directive, FLL) and prevent water penetration as a result of the wind load or collection in front of particularly endangered areas. The surface water and suspended substances are discharged via the lateral drainage slots into branch channels that lead to the gullies, in the free area below block pavements on raised floors/sacks of mortar and/or into the drainage layer.
A branch channel is a hollow body with lateral drainage slots. Its front side is attached to the drainage slots of the channel body and the gully top for roof gullies, and lies within the drainage layer. Therefore, it connects the channel body and the gully top, and forms a defined drainage channel (direct connection to the drainage system).
The gully tops for roof gullies on terrace surfaces must be arranged across the roof gullies as inspection shafts.



ACO ProfilineX
5 cm OH

ACO ProfilineX
7.5 cm OH

Scope
- Façades
- Terraces
- Balconies
- Porches
- Green roofs
- Roof gardens
- Barrier-free construction

Carrying capacity
- Accessible on foot
- Accessible for wheelchairs

Materials
- Glass fibre reinforced polypropylene (PP GF)
- recyclable

Combination of materials
A combination with stainless or galvanized steel is no problem at all

Channel connections
- tool-free
- Click connection
- compensates linear expansion

grating stop
- tool-free
- pre-assembled
- partly without stop

Channel elements
- with drainage channel
- with integrated gravel ledge

Cleaning
- rinse with water
- with brush/broom
- with trowel

Slope
- without slope

Fire behaviour according to DIN 13501
- Classification **E**

Tolerability
- Gritting salt
- Sea climate
- Sulphur dioxide
- Contact stainless steel/galvanized steel
- Metal dust (e.g. railway traffic)
- Cleaning agent

Limited
- chlorine-containing liquid

General information

It is possible to cut the channel body for length adjustment without any problems.

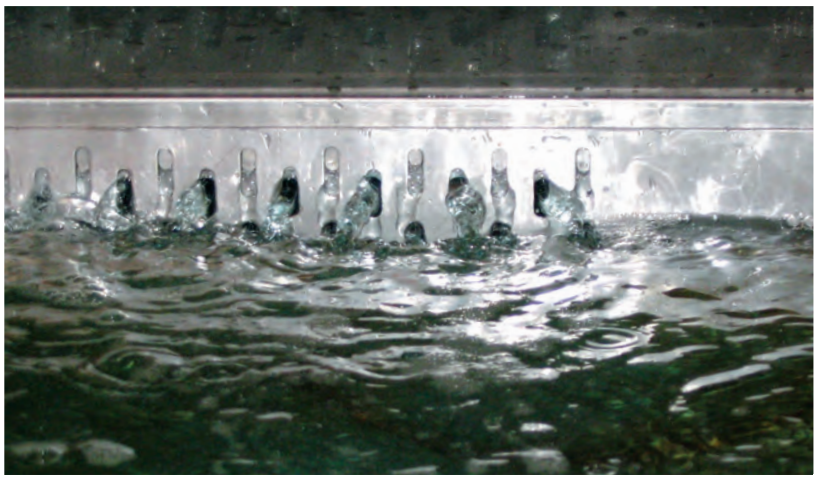
A metal saw is recommended for this.

The interfaces do not need to be protected against corrosion.

Hydraulic test of the ACO Profiline system

The hydraulic performance of the ACO Profiline channel system has been tested on one of the independently monitored test benches recognised by the State factory inspectory.
Goals:

- Gaining further practical insights about the performance of various ACO Profiline types and their covers
- Verification of the hydraulic calculation principles
- Assessment of the drainage performance for various roof structures
- Ensuring the assessment of barrier-free transition elements



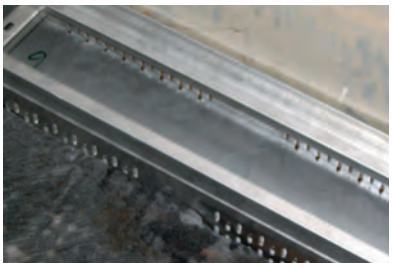
Test bench

- Test report no. 5351022-20 (State factory inspectory-certification)
- Test pool 2 m x 2 m x 0.8 m
- Test pool volume approx. 2,500 l
- Pump performance 40 l/s
- Rated connection widths DN 40 – DN 150
- Testing flat roof gullies, façade channels etc.
- Testing seals up to 0.5 bar
- Train length respectively 1 m

Test set-up

The hydraulic performance of the ACO façade channels is primarily influenced by the installation situation and the cover gratings. The example calculations clearly show the huge impact of the underlying conditions. Especially in the field of barrier-free door sills it is clear that free water flow is the decisive factor.
There will be no general solution for each barrier-free door sill in the future, however we can provide support in the planning phase.

Testing the channel body with mesh grating 30 x 10 mm, free gully with raised coating

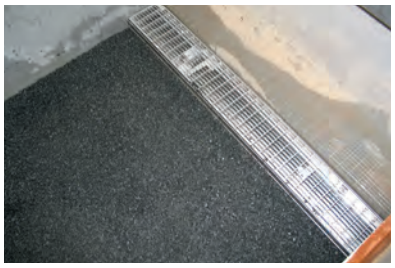


Test set-up with drainage mat and gravel bed in front of the channel body

Test set-up with drainage mat and gravel bed in front of the gully top

Test set-up with branch channel lateral (without a section in the channel body)

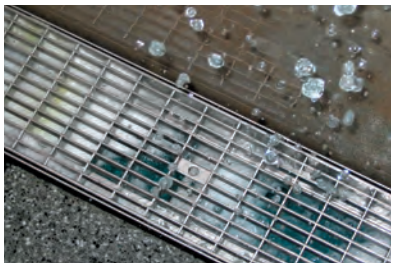
Test set-up with branch channel lateral (without a section in the gully top for roof gullies)



Gravel bed with 2/5 mm gravel

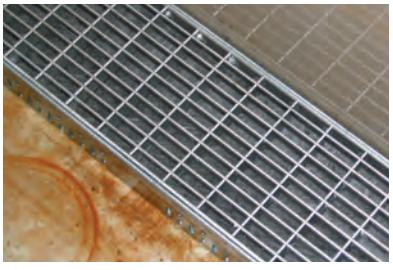
Channel system loosely installed

Rainfall on the installed façade channel



Water level up to the lower edge of the cover grating

Maximum rainfall of the surface clearly shows the important function of the gully tops for roof gullies



When clean, an inserted dirt fleece reduces the hydraulic performance of the system by 30%

Results of the hydraulic test of the ACO Profiline Systems

	Overall width 10 cm l/(sec x m)	Overall width 13/15.5 cm l/(sec x m)	Overall width 20/25 cm l/(sec x m)	Remarks
Fixed building height 5.0 cm Mesh grating 30/10	1.15	1.15	1.15	No spraying
Fixed building height 7.5 cm Mesh grating 30/10	2.50	2.50	2.50	No spraying
Type I - adjustable 5.5 – 7.8 mm Mesh grating 30/10	1.50 to 2.25	1.50 to 2.50	1.50 to 2.50	No spraying
Type II - adjustable 7.8 – 10.8 mm Mesh grating 30/10	2.25 to 3.40	2.50 to 3.75	2.50 to 3.75	No spraying
Type III adjustable 10.8 bis 16.8 cm mesh grating 30/10	3.40 to 4.15	3.75 to 5.25	3.25 to 5.25	No spraying
Ladder grating Perforated grating Heelsafe 7/12.5 Heelguard 3/8 Longitudinal slot grating Crosswise slot grating	– – – – – –	2.25 0.75 2.50 2.50 0.75 0.75	– – – – – –	Light spraying Heavy spraying Light spraying Light spraying Heavy spraying Heavy spraying
Mesh 30/10 with dirt fleece 135 g/m^2		Reduction -30%		Not recommended (risk of blockages)
Boards (4 cm) on raised floor supports construction height 9 cm		Drainage output see above		Recommendation barri- er-free transition elements
Boards (4 cm) in double-crushed chips (2/5 mm), with branch channel to the gullies, construction height 9 cm		0.50		Drainage via gravel bed and branch channel
Boards (4 cm) in double-crushed chips (2/5 mm), with drainage mat (1 cm), construction height 9 cm		0.50		Drainage via gravel bed and drainage mat
Boards (4 cm) in double-crushed chips (2/5 mm), construction height 9 cm		0.20		Drainage via gravel bed

The test was carried out respectively on a train length of 1 m

Excerpts from the basis for calculating the rainfall

Rainfall calculations

- Rainfall according to DIN EN 12056
  0.03 l/(s × m^2) acc. 300 l/(s × ha)

- Rainfall acc. to DIN 1986-100:2008-05
  0,0452 l/(s × m^2) acc. 452 l/(s × ha)
  (r 5.5 for Rosenheim – so-called 5-minute rain)

- Rainfall acc. to DIN 1986-100:2008-05
  0.0853 l/(s × m^2) acc. to 853 l/(s × ha)
  (r 5.100 for Rosenheim – so-called century rain)

Calculation for façade channels with supported coating

- ACO Profiline fixed building height 7.5 cm with mesh 30 x 10 = 2.50 l/(sec × m)

- Rainfall 0.03 l/(s × m^2) (acc. to DIN 12056)

- Block pavements on floor supports (free gully)

- The façade is calculated with 50% of the surface

Example calculation for the maximum drainage output

- Hydraulic capacity of the channel: Rainfall x 50% figure for façade

$$\frac{2.50\ l}{s \times m} : \frac{0.03\ l}{s \times m^2} \times 2$$

Result: 166.5 m façade height per metre channel train

Calculation for façade channels with coating in gravel bed

- ACO Profiline fixed building height 7.5 cm with mesh 30 x 10 = 2.50 l/(sec × m)

- Rainfall 0.0853 l/(s× m^2) (acc. to DIN 1986-100 for Rosenheim)

- Block pavements in the 2/5 gravel bed 0.20 l/(sec × m)

- The façade is calculated with 50% of the surface

Example calculation for the minimum drainage output

- Hydraulic power of the gravel bed: rainfall x 50 % figure for façade

$$\frac{2.50\ l}{s \times m} : \frac{0.0853\ l}{s \times m^2} \times 2$$

Result: 4.69 m façade height per metre channel train

Barrier-free door sills -

low connection heights through façade and terrace channels

Essential requirements for the successful installation of barrier-free door sills:

- Consulting in the planning phase
- Calculation of the drainage output
- Practical experiences

ACO will help you with all these issues.

Entrance doors without sills are always used in public buildings
Transitions that are as level as possible between residential areas and roof terraces, the balcony or porch and the stepless building entrance areas are critical design points that need to be planned with care because the effect of the weather (driving rain, snow drifts) can quickly cause damage to the building. All underlying conditions, e.g. structure thickness inside and outside, ceiling offset and slope need to be taken into account as early as the planning phase.

Sill-free transition between buildings and outdoors
often leads to conflicts with technical directives. There are tried and tested solutions for this, although they do not comply with all aspects of the directive: By laying external drainage channels parallel to the door, protection against moisture can be achieved without a major difference in height between the external and internal levels.

The specifications of the directives
are not only inconsistent to the formulated specifications for barrier-free construction, but were and are seen as impractical by numerous architects, facility management and residents alike. Large sill heights are undesirable in many areas and are not installed.

Barrier-free door sill - checklist for planning

Planning barrier-free door sills
All experience with reducing the connecting height from 15 cm to 5 cm should be used.
The following points should be taken into account when planning barrier-free door sills:

- Planned height of the raw construction
- Structure thicknesses inside and outside
- Thermal insulation
- Slope version

General sill design

- It is a special design that needs to be specified by the planning department
- A drainage channel is mandatory in this area
- The building owner must approve this connection detail
- The planner and the builder must coordinate this

Assessment of the planned sill design

- Hydraulic calculations of a drainage channel must be available
- A roof, a closed railing or lateral weather protection can help
- Check and ensure the alignment and main wind direction

Assessment of the surface drainage

- We recommend a raised surface coating with at least 3 cm space to the horizontal drainage
- Support for the gravel or stone layer by means of drainage mats or branch channels leads to significant improvements here
- Drainage layers only comprising stones or gravel have the lowest drainage effect and also the most unreliable due to pollution

Slope

- A planned slope of at least 2% of all water-carrying layers (1.5 % DIN 18531-5)
- Slope must always face away from the connection point.

Sealing ring

- The sealing ring should reach up to at least the top edge of the channel system
- The sealing ring must be secured against back-seepage
- On-site storage of the sealing ring

Roof gullies

- At least two drainage points are required
- An emergency overflow can also be used as a second drainage point

Drainage channel

- Dimensioning according to hydraulic calculation taking into account all underlying conditions
- Installation across the entire width lateral to the running direction
- Maximum clearance to the sealing ring connection 5 cm
- Use of channel bodies with perforation on both sides

Cover grating

- Use of mesh gratings (mesh 30 x 10, the longer mesh width lateral to the running direction)
- More than 50% free opening diameter
- Minimum slot width of 8 mm
- We do not advise using a dirt fleece below the grating. The system stops being functional when the mesh is obstructed

Lower door hinges and door sills barrier-free

- The tightness of the lower door hinges can be achieved by using special door systems
- The sealing ring must be secured against back-seepage of the door profile
- The sealing ring and the door profile should reach up to at least the top edge of the channel system
- Maximum height 2 cm

Summary
Correctly dimensioning the ACO façade and terrace channel in the pre-planning phase restores the lost connection height of the sealing ring. A barrier-free door sill also needs to be on the same level after taking into account all listed underlying conditions.

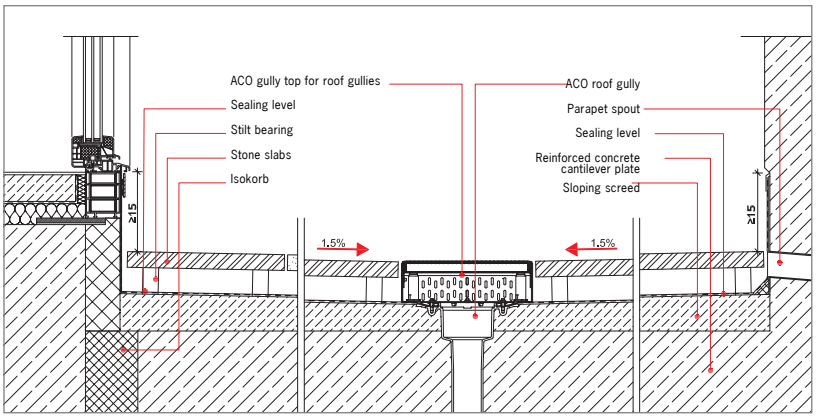
Bibliography
Important contents were drafted in collaboration with and the kind permission of the author engineer Nils Oster, Ö.B.U.V. Authority, and are contained in the book 'Damage to balconies' from the series 'Damage-free construction' by the Fraunhofer IRB publishing house.

Building sealing ring - summary of DIN norms and special regulations

max. 15 cm connection height of sealing rings on doors, glass fronts and similar to the surface of the coating with additional measures is possible.

- Rules for roofs with sealing ring (Flat Roof Directive), Par. 4.4 (1) connection height on doors, fig. 6.1 (As per: 12/2016)
- DIN 18531-5 Sealing rings on roofs, balconies, porches and access balconies

Balcony with roof gully
'Sealing height' according to standard Roof edge with wall flange

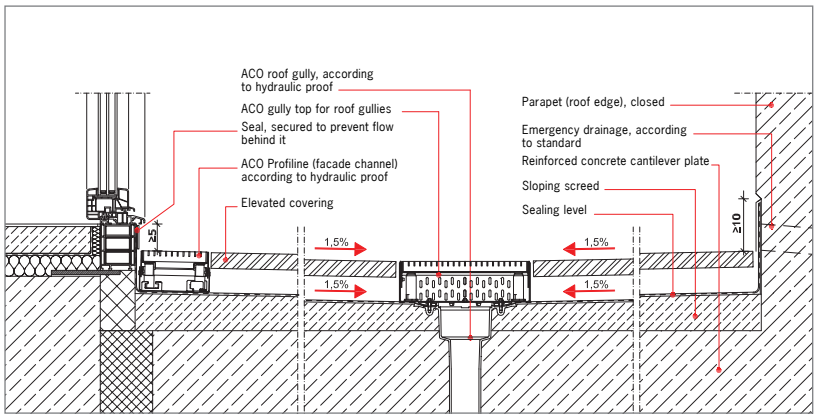


max. 5 cm connection height of sealing rings on doors, glass fronts and similar to the surface of the coating with additional measures is possible.

- Rules for roofs with sealing ring (Flat Roof Directive), Par. 4.4 (2) reduction of connection height on doors, fig. 6.2, 6.3 and 6.4 (As per: 12/2016)

- NEW! Amendment of the Flat Roof Directive 12/2016 "if the splashwater volume is not minimised by a roof, mesh gratings that are at least 150 mm wide should be used".

Balcony with roof gully
'Sealing height' 5 cm – Roof edge with wall flange



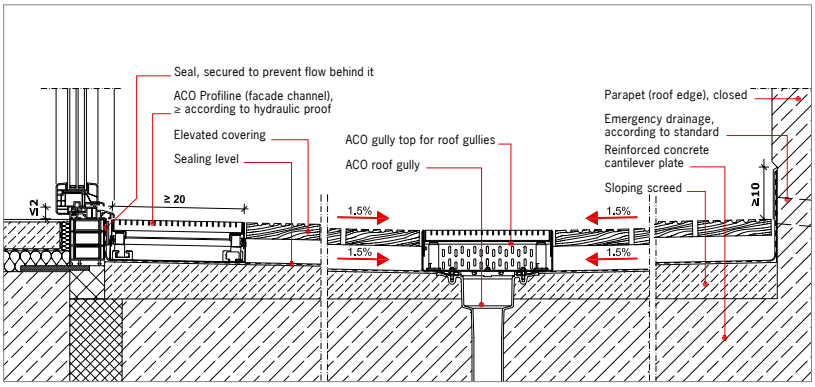
Information about reducing the connecting height of sealing rings on doors, glass fronts and similar to 5cm above the surface of the coating.
The Flat Roof Directive and FLL guidelines present a clear solution for this connecting point. According to this, it is possible to reduce the connecting height to 5cm (upper edge coating/channel up to upper edge sealing ring), if flawless water drainage is ensured in front of the connecting area at all times. This cannot usually be guaranteed by a roof gully because the distance from the roof gully to the ascending sealing ring needs to be at least 30 cm.
For this reason, drainage channels that are perforated on both sides (drainage slots) are used here.
The channel system should have a cover to match the local conditions
And drain by means of the drainage slots above the sealing ring into the drainage layer.

The building height of the channel body may not be 10 cm. A decisive factor is that the water can drain at all times (hydraulic calculation)!

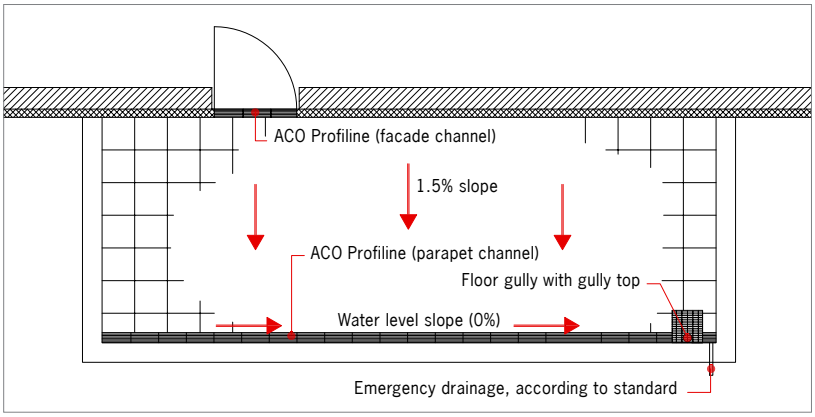
Barrier-free door sills (max. 2 cm) – same-level connection height of sealing rings on doors, glass fronts and similar to the surface of the coating with additional measures is possible.

- Rules for roofs with sealing ring (Flat Roof Directive), Par. 4.4 (3) Barrier-free transition elements (As per: 12/2016)
- DIN 18040 Part 1 and 2, doors 4.3.3.1 General

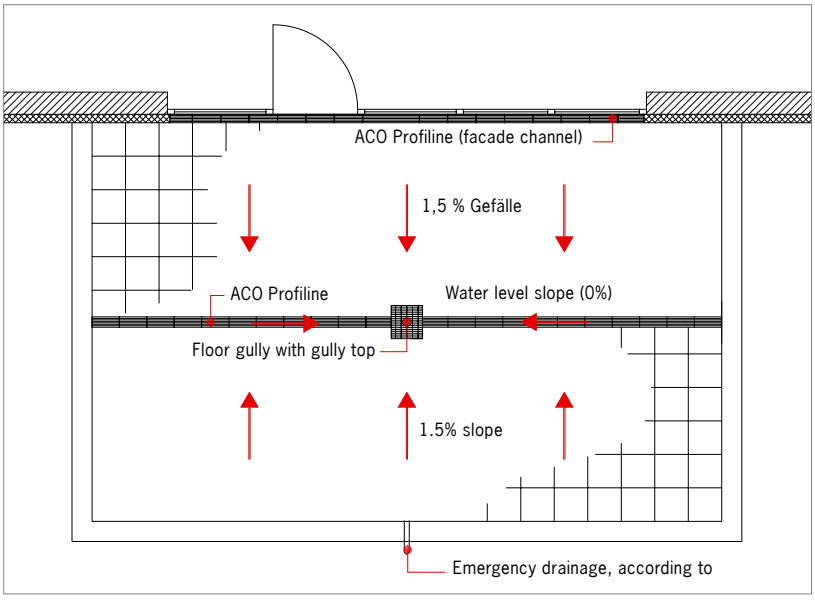
Balcony with roof gully
'Sealing height' 0 to 2 cm – Roof edge with wall flange



Balcony with railing (closed roof edge)
Linear drainage - slope to railing

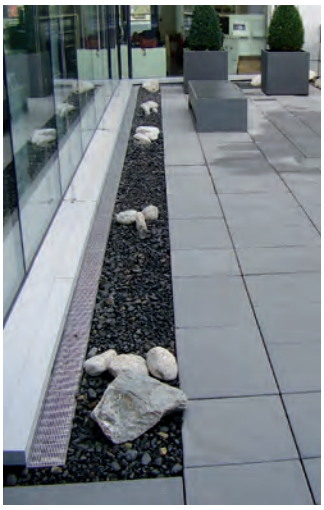


Roof terrace with railing (closed roof edge)
Linear drainage - slope to middle

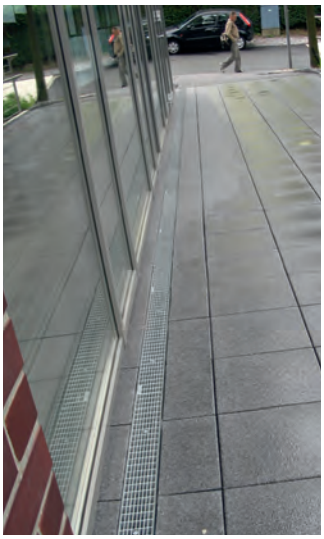


References

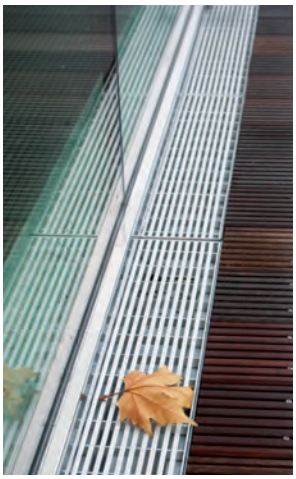
Rottendorf – sOliver



Solingen – Haribo

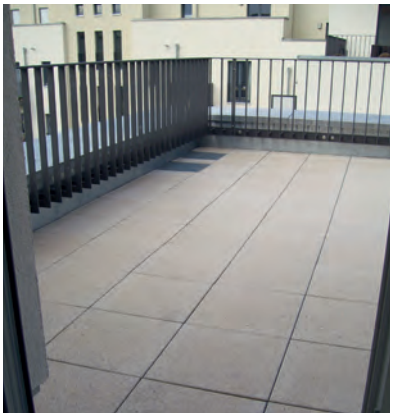


Köln – AXA



Hamburg – Ergo

Leipzig – Rosental terraces



Every ACO building construction product supports the ACO system chain

System solutions for the cellar

- Basement windows
- Assembly panels for light wells
- Pressurised watertight light wells
- Backflow systems

Infrastructure for house and garden

- Bath drainage
- Well covers
- Façade drainage channels
- Linear drainage
- Point drainage
- Doormats
- Infiltration
- Surface water harvesting

Barn windows and escape doors

ACO Hochbau Vertrieb GmbH

Postfach 11 25
97661 Bad Kissingen
Neuwirtshauser Straße 14
97723 Oberthulba/Reith
Phone +49 (0)9736 41-60
Fax +49 (0)9736 41-69
Germany

hochbau@aco.com
www.aco-hochbau.de

MA 5094/02/2020 Subject to alterations