

# Surface Drainage

## for heavy duty applications

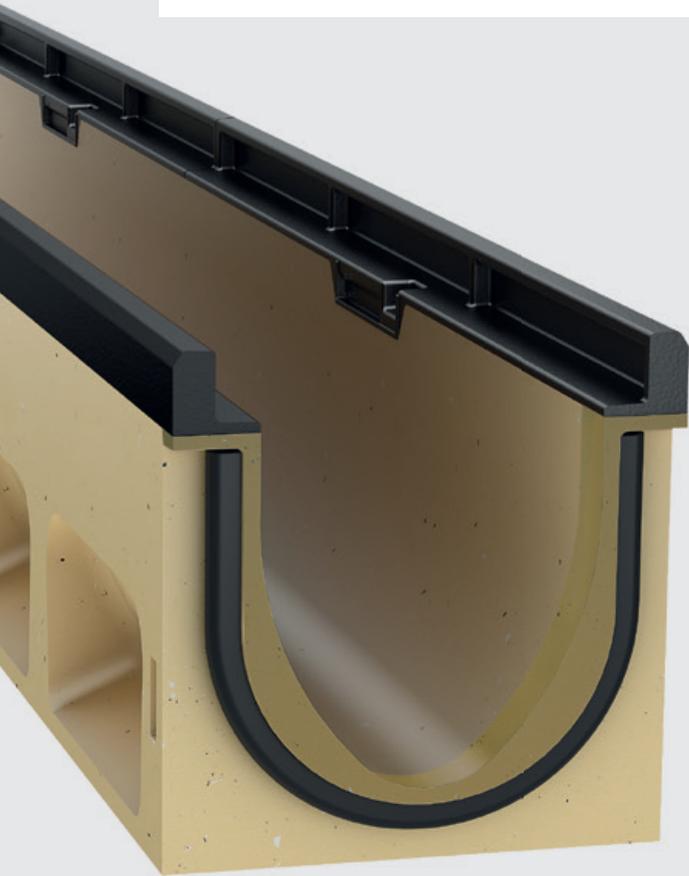
ACO DRAIN® PowerDrain Seal in  
ACO DRAIN® PowerDrain Performance



## ACO DRAIN® PowerDrain with Seal in Technology

ACO has taken surface drainage for heavy load applications one step ahead: the new ACO DRAIN® PowerDrain channel system is equipped with a cast iron edge rail and a strengthened channel body in addition to the integrated seal at the channel joint.

The range is complemented by innovations – for example in the grating design.



## strong

Strengthened channel body  
for direct installation up to  
class E 600

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## safe

A new concept for the Powerlock –  
self-locking, secure and quiet with  
a single click

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## watertight

Seal in technology –  
the EPDM seal for active  
environmental protection

Page 16

## PowerDrain Performance

Complete set with  
E-coating

Page 20





## **ACO. creating the future of drainage**

ACO Group 04

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### **The new PowerDrain product range**

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### **ACO Service**

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ACO. creating

the future of drainage

## The worldwide ACO Group. A strong family you can build on

The ACO Group is a world market leader in drainage technology. Climate change sets us a challenge to react effectively with innovative solutions to new environmental conditions. With its integrated approach, ACO stands for professional drainage, efficient cleaning, and the controlled discharge or reuse of water. Products include drainage channels and drains, oil and grease separators, backflow stop systems, pumps and pressure-water-tight cellar windows and light shafts.

The family-owned company headquartered in Rendsburg/Büdelndorf, Germany, was founded in 1946 on the site of the Carlshütte foundry – Schleswig-Holstein's first industrial company. It still has very strong roots in the region. The innovation strength of the ACO Group is built on intense research and development, and its technical expertise in processing polymer concrete, plastic, cast iron, stainless steel and reinforced concrete.

## ACO Civil Engineering. Solutions for the Infrastructure of tomorrow

As a reliable partner of the specialist civil engineering construction materials trade, ACO offers solutions for professional surface water management and water protection. The company plays a large role in the planning and design of urban, infrastructural and industrial drainage. Whether for public clients, consultant engineers, landscape gardening architects, contractors and operators, within ACO provides not only innovative product solutions for civil engineering, road construction and landscape gardening. With comprehensive design tools and services, ACO can also assist with the design, construction and sustainable operation of modern drainage systems.

[www.aco.com](http://www.aco.com)



Headquarters of the ACO Group  
in Rendsburg/Büdelndorf



**5,000**

employees in more than 46 countries (Europe, North America and South America, Asia, Australia, Africa)

**900 Mio.**

Euro Sales 2020

**36**

Production sites in 18 countries



**ACO Academy**  
for practical training

**Holder**  
Iver and Hans-Julius Ahlmann







ACO DRAIN®  
PowerDrain Seal in –  
the modular system  
with a variety of grating options



ACO DRAIN®  
PowerDrain Performance –  
the complete set  
with channel and grating

## The new PowerDrain product range

surface drainage for  
heavy load applications

The new ACO DRAIN® PowerDrain channel system not only offers watertightness as standard thanks to the integrated seal at the channel joint, but is also equipped with a 12 mm cast iron edge rail and the extra-strengthened channel body.

This range is supplemented by innovations that provide a strong and safe system – individually and economically tailored to your needs using a modular system or as all in one in the PowerDrain Performance version.

### System overview

- Standard lengths 1 m and 0.5 m
- Nominal sizes 100, 150 and 200 mm, more to follow
- Channel body with liquid-tight pipe connection
- Slope channels
- Sump unit

# PowerDrain Seal in – individual and flexible

## Versatile gratings for attractive projects

The ACO Drainlock and Powerlock gratings offer a wide range of covers in many shapes, colours and materials. Here we are only showing you the cast iron gratings recommended for combination with the cast iron edge. However, Drainlock grates made of stainless steel, hot-dip galvanised steel or plastic are also available. The gratings meet all requirements in terms of aesthetics, functionality and load.

### **NEW** Class D 400, F 900 Powerlock gratings

**Powerlock grating**  
Cast iron



**Powerlock grating**  
Cast iron



- new grating design for optimal water intake and excellent hydraulics
- with new Powerlock locking device
- with new damping on the grating

### Drainlock Roste der Klassen A 15 – E 600

**Slotted grating**  
Cast iron



**Slotted grating**  
Cast iron heel guard



**Longitudinal bar grating**  
in cast iron mesh design



**Longitudinal bar grating**  
Cast Iron Design Ray



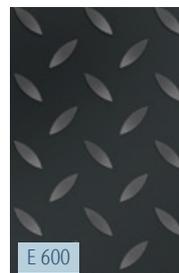
**Light point**  
Cast iron  
LED lighting

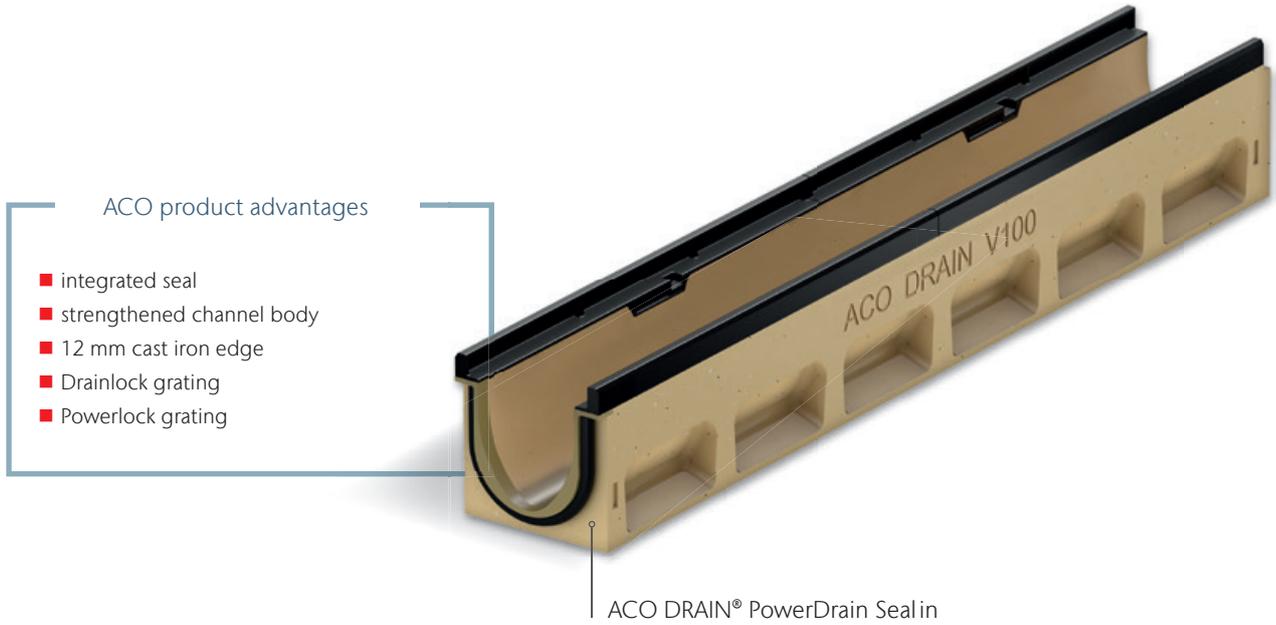


**Freestyle**  
Customised  
cast iron grating



**Cover plate closed**  
Cast iron





## Typical areas of use

Application	PowerDrain Seal in Gratings of classes A 15 – E 900
Seal type at channel joint	Seal in
Bus station	■
Container handling areas	■
Design and light	■
Airports	■
Warehouse gates	■
Industrial areas	■
Lorry parking garages	please use our technical service to support your planning*
Truck car parks	■
Logistics areas and roads	■
Petrol stations and service stations	■
Underground car parks	please use our technical service to support your planning*
Washing bays and yards	please use our technical service to support your planning*
German Federal Water Act sites: Storage, filling and handling facilities	please use our technical service to support your planning*

\*Please use our technical service to support your planning

# PowerDrain Performance – for all heavy-duty applications

## All-in-one with the PowerDrain Performance

With the all-in-one set, you only have to make one choice to achieve the full performance of the new PowerDrain. As the premium model, the PowerDrain Performance offers the highest-quality functions of the PowerDrain system combined in one product: the Seal in technology, the Powerlock grating with damping insert and the cathodic dip coating for the grating and frame. Your best choice!



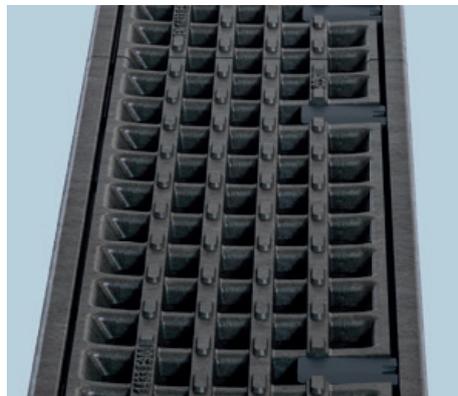
### **Cathodic clip coating**

Cathodic clip coating of grating and frame as protection against corrosion.



### **Safety locking device**

The new ACO Powerlock safety locking device provides a safe and user-friendly way to lock the grating onto the channel. The locking elements made of high-strength plastic ensure long-lasting functionality.



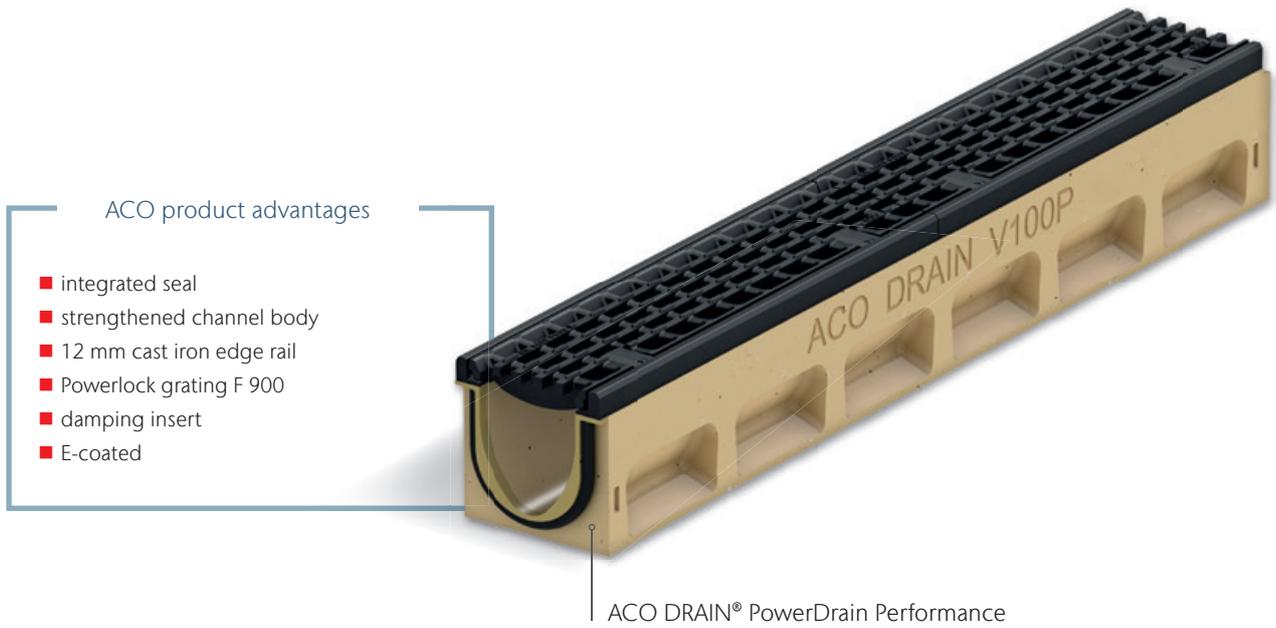
### **Cast iron grating with Powerlock**

The newly designed cast iron grating offers maximum safety against lateral overflow. The longitudinal bar design combines a large inlet cross-section with a modern look and optimum hydraulic performance.



### **Damping insert**

Due to its design, the damping makes an active contribution to noise protection in road traffic. This makes the heavy-duty channel usable in all kinds of areas.

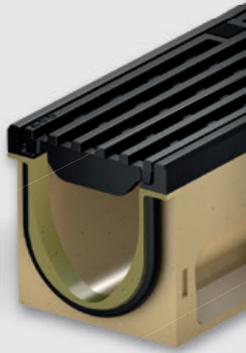


## Typical areas of use

Application	PowerDrain Performance Class F 900 Powerlock gratings
<b>Seal type at channel joint</b>	Sealin
Bus station	■
Container handling areas	■
Design and light	■
Airports	■
Pedestrian zones and streets	■
Warehouse gates	■
Industrial areas	■
Lorry parking garages	please use our technical service to support your planning*
Truck car parks	■
Logistics areas and roads	■
Public paths and spaces	■
Petrol stations and service station	■
Underground car parks	Ramps
Washing bays and yards	please use our technical service to support your planning*
German Federal Water Act sites: Storage, filling and handling facilities	please use our technical service to support your planning*

\*Please use our technical service to support your planning

2





## The product advantages for all kinds of areas

### The PowerDrain family

Since pure function is not enough, we have comprehensively developed the PowerDrain further in terms of the safety, watertightness and the requirements that are important to you. That is why the ACO DRAIN® PowerDrain is the future-oriented solution for the drainage of heavy-duty areas and for landscaping. On the following pages we will present the advantages of the system in more detail.

**safe**

**watertight**

**strong**

# safe

## Secure with a single click – thanks to the way the new ACO Powerlock locking system works

ACO has developed a completely new locking mechanism for the PowerDrain that gives you audible security with a single click.

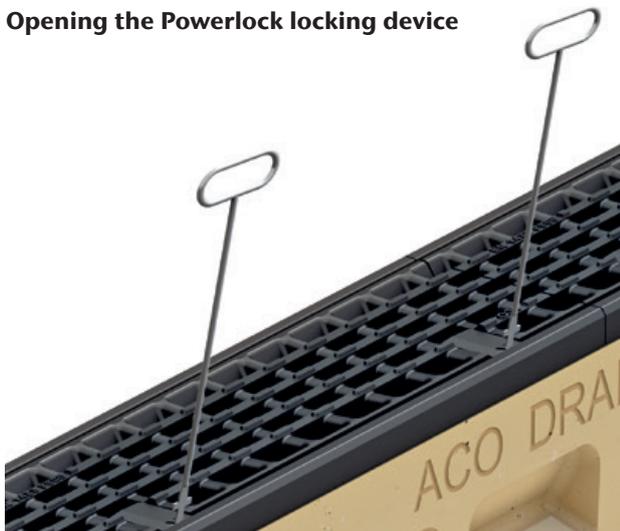
When the grating is inserted into the channel, a strong foot-step is all that is needed and the latch slides back over the edge of the frame and then snaps securely into place below the frame. The grating is now securely locked and can no longer be unlocked without the use of tools. Maximum safety!



## How does the safety locking system work?

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### Opening the Powerlock locking device



The grating can only be removed from the channel by manually unlocking it with the help of two grate hooks.

### Closing the Powerlock locking device

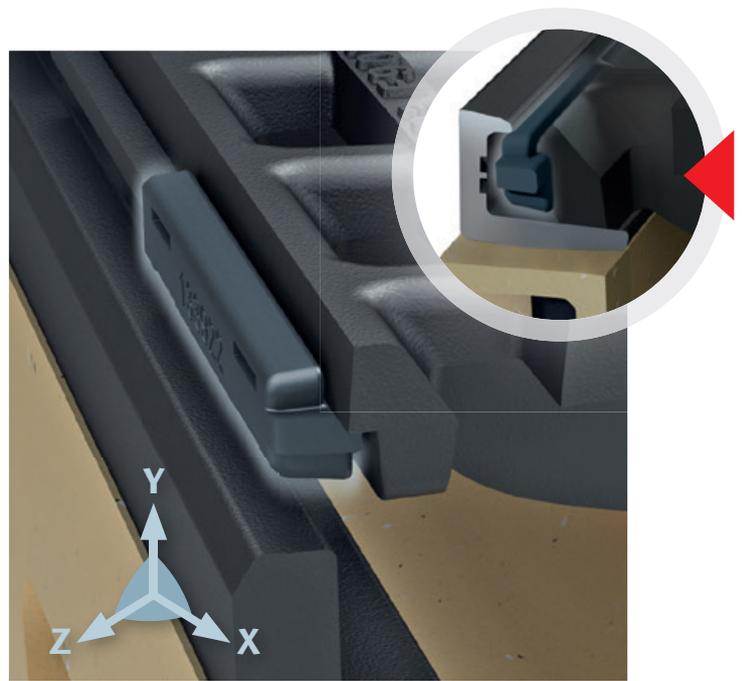


After placing the grating on the channel body, the grating is locked into place by stepping on it. Secure with a single click – without the need for tools!

## An end to noise – Quiet when driving over

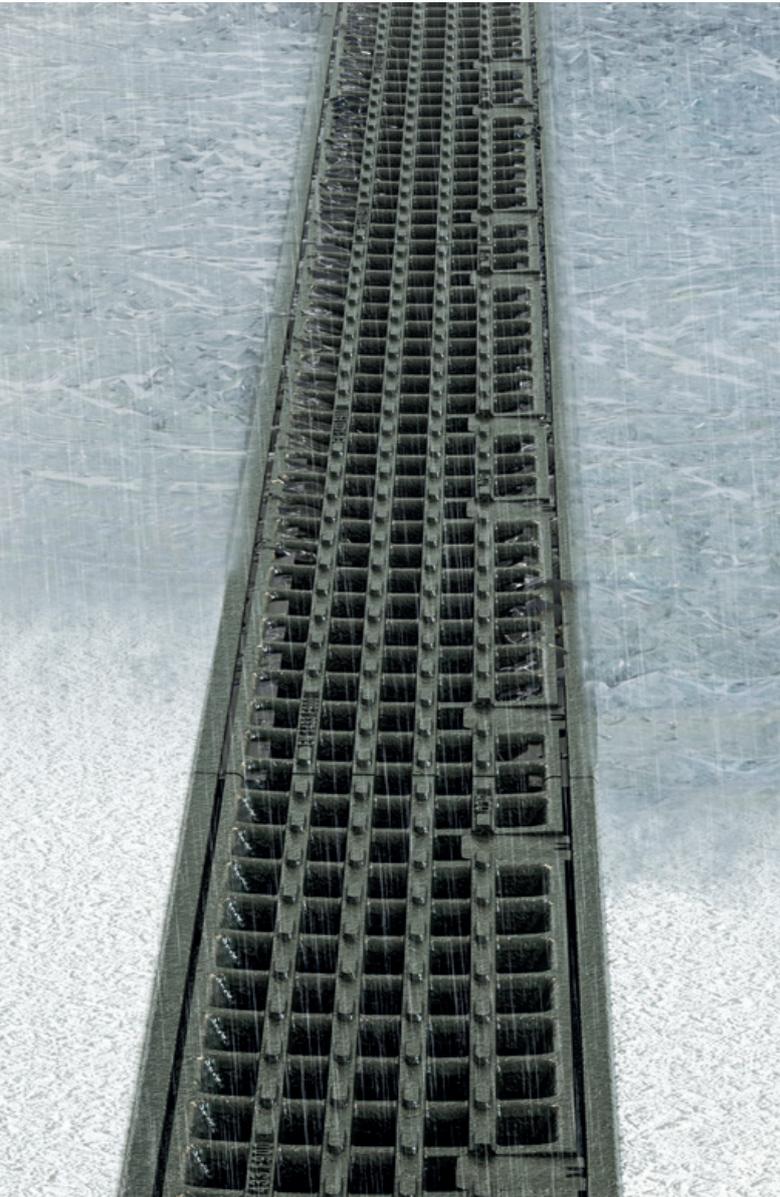
ACO has taken damping on the grating one step ahead.

New cushioning inserts now work even better in combination with the new safety locking device. The dampening system ensures there is no noise when driven over. This is important in residential areas, especially for garage entrances and access ramps. The special elastomer dampers – two per grating on one side of the grating, opposite the new locking device – ensure permanent and safe noise damping.



### The damping acts in three dimensions

The intelligent damping insert in combination with grating, safety locking device, frame and channel body



## Grating design – reliable in challenging installation applications

When used at warehouse gates, ramps and access roads for parking garages, it is particularly important to avoid lateral overflow. The longitudinal bar design of the grating effectively prevents this - ensuring that warehouses and garages remain dry, even in heavy rain.

The slope on ramps also adds to the higher flow velocity of the surface water. No problem for the new ACO PowerDrain Performance.

# watertight

## *Surface water management expert!*

That is the motto of Michael Müller, Business Unit Manager ACO DRAIN® drainage channels. Right from the product development stage, the aim was to prevent irreversible damage to *nature, the environment and buildings*.

Surface runoff contains significantly more contaminants than one might assume. Heavily trafficked roads are contaminated with pollutants. All these contaminants are washed into structures and *groundwater* when it rains and can cause considerable damage. Road salt can cause corrosion and weaken foundations.

ACO DRAIN® drainage channels equipped with an integrated seal absorb the water and feed it without loss to the *rainwater treatment system* and ultimately to the natural *rainwater cycle*. This allows them to make a decisive contribution to the safe collection and drainage of polluted surface water. Damage to structures, weakening of concrete foundations and groundwater contamination can be minimised from the beginning.

## ACO makes the channel run watertight\*

### **This is made possible by the channel joint with seal and the liquid tight material:**

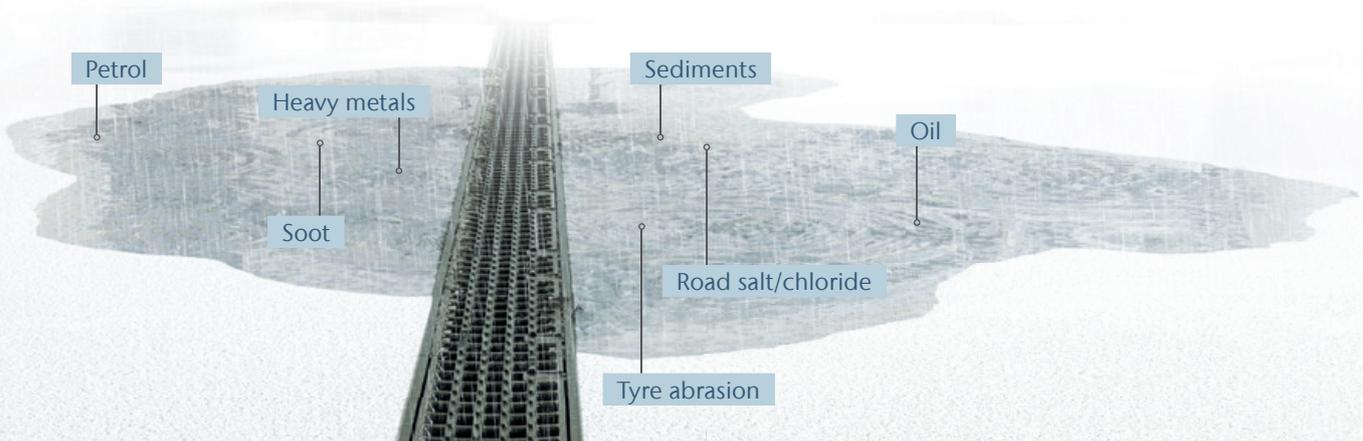
the unique combination of the integrated EPDM seal and the watertight ACO polymer concrete ensures a continuously liquid tight channel run in accordance with the requirements of DIN EN 1433 / DIN 19580. In addition to the ACO polymer concrete, the loss-proof two-component seal is an essential component of the **Sealin technology**.

The channel body is also produced in a special two-component process. This creates a liquid-watertight channel run which transfers the collected surface runoff to the ACO system chain without any losses. Through targeted rainwater management, the structure and groundwater are permanently protected.

**Sealin**  
TECHNOLOGY



IKT - Institute for Underground Infrastructure, Gelsenkirchen

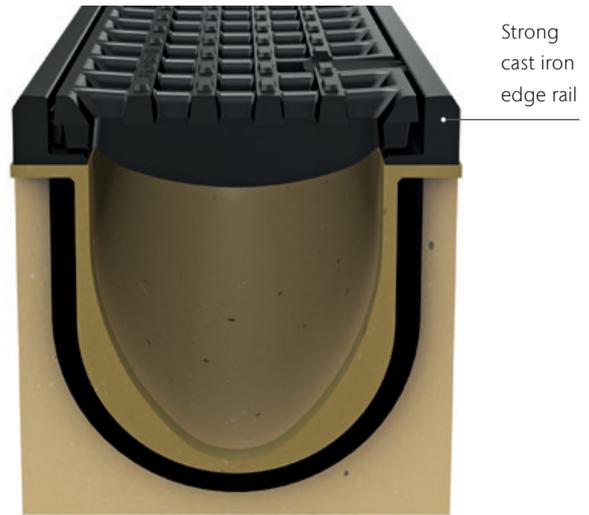


**\*Watertight – certified through long-term simulation**

The PowerDrain integrated Seal in technology exceeds the requirements for watertightness according to DIN EN 1433 / DIN 19580, section 9.3.6 (duration of watertightness at least 30 min. +/- 0.5 min.) many times over. During the leak test according to IKT certification procedure DO1185, a permanent tightness was proven for 72 hours after cyclic loading. The load cycles used here simulate years of traffic crossing the channel joint.

# strong

High traffic load needs a strong solution – based on intelligent design



Our engineers have streamlined the design of the channel body for maximum efficiency. This is how we get the most out of our polymer concrete material. Created for all load classes and equipped with tremendous side wall stability.

The 12 mm wide cast iron edge rail contributes to the stability of the channel and makes it especially strong. The channel is completed by our F 900 cast iron grating that is suitable for all applications. Gratings of all classes from A 15 to F 900 with Drainlock or Powerlock can be used.



## The advantages in detail: side wall stability to take the load

The correct installation taking also expansion joints into account is basic. A high level of stability of the channel body side walls to take the loads transferred from the surfaces is needed. This is, where ACO PowerDrain plays out its advantages.

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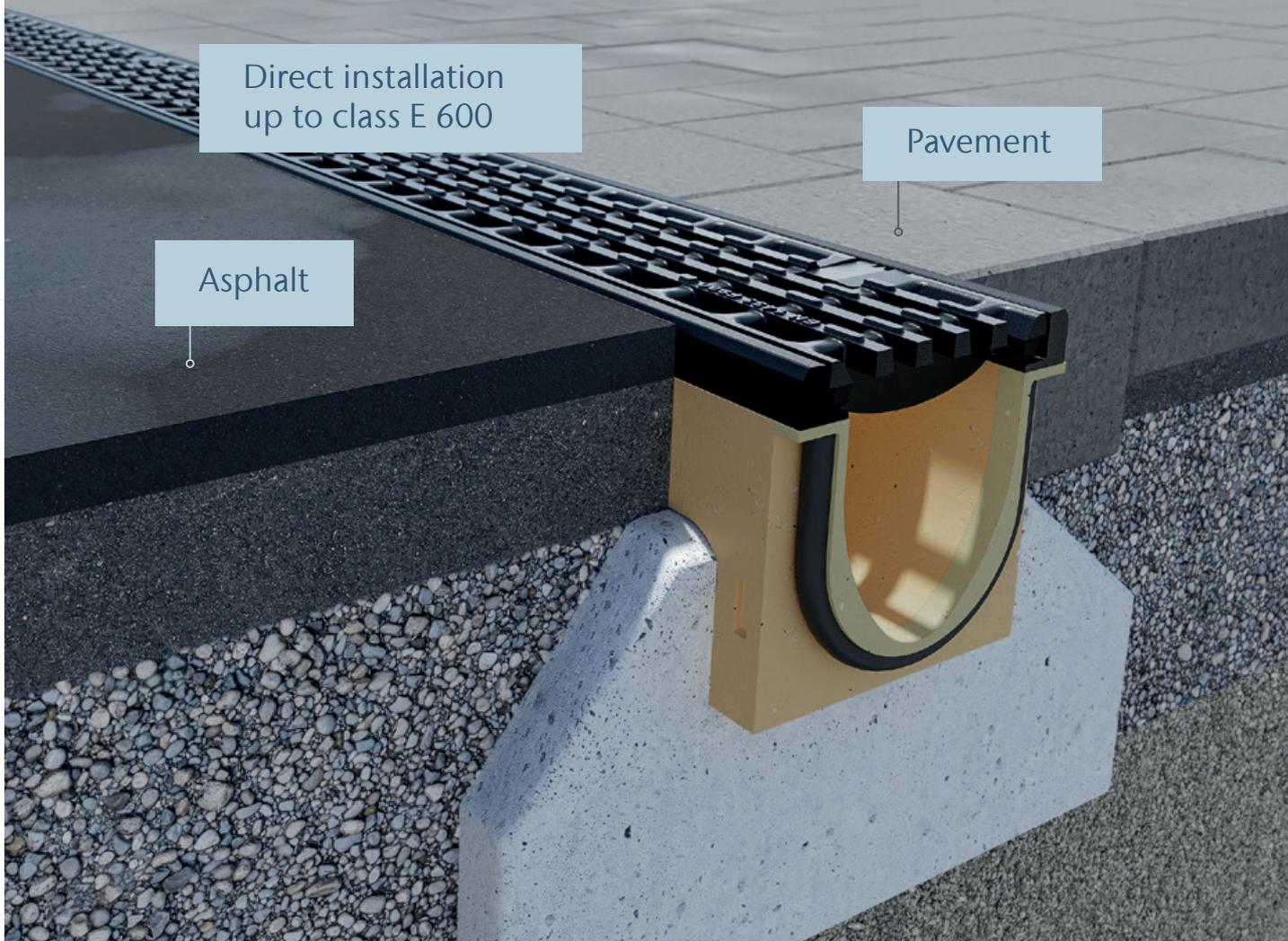
The improved geometry makes the channel body more robust



## Surface design without compromise – for all applications

The strong channel body allows direct installation of asphalt and paved surfaces up to class E 600. In applications with a paved surface the use of a stretcher is mandatory.

The ACO PowerDrain is now even easier to install in applications involving forklift traffic in asphalt and paved areas.

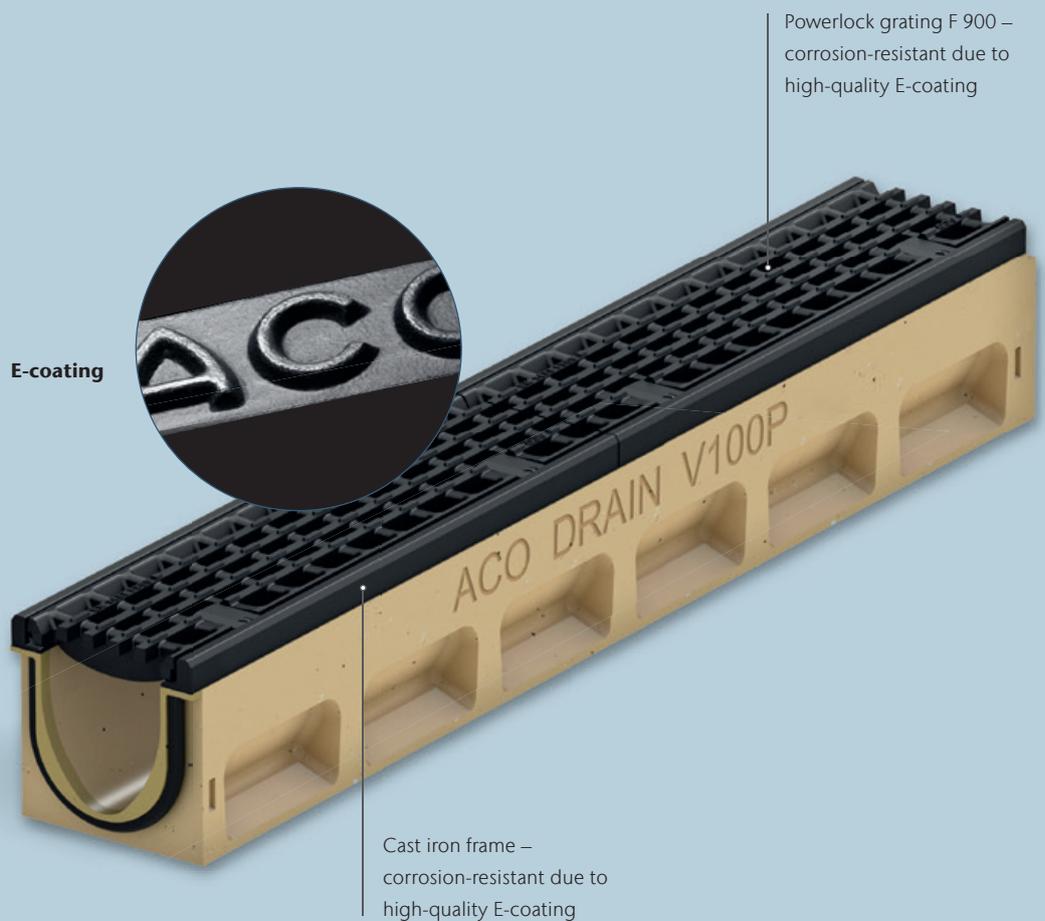


# PowerDrain Performance – the all-in-one

## safe · watertight · strong

You only have to make one choice and you will receive all of the product benefits including the E-coating in an all-in-one set. This ensures that you get full performance for every application.

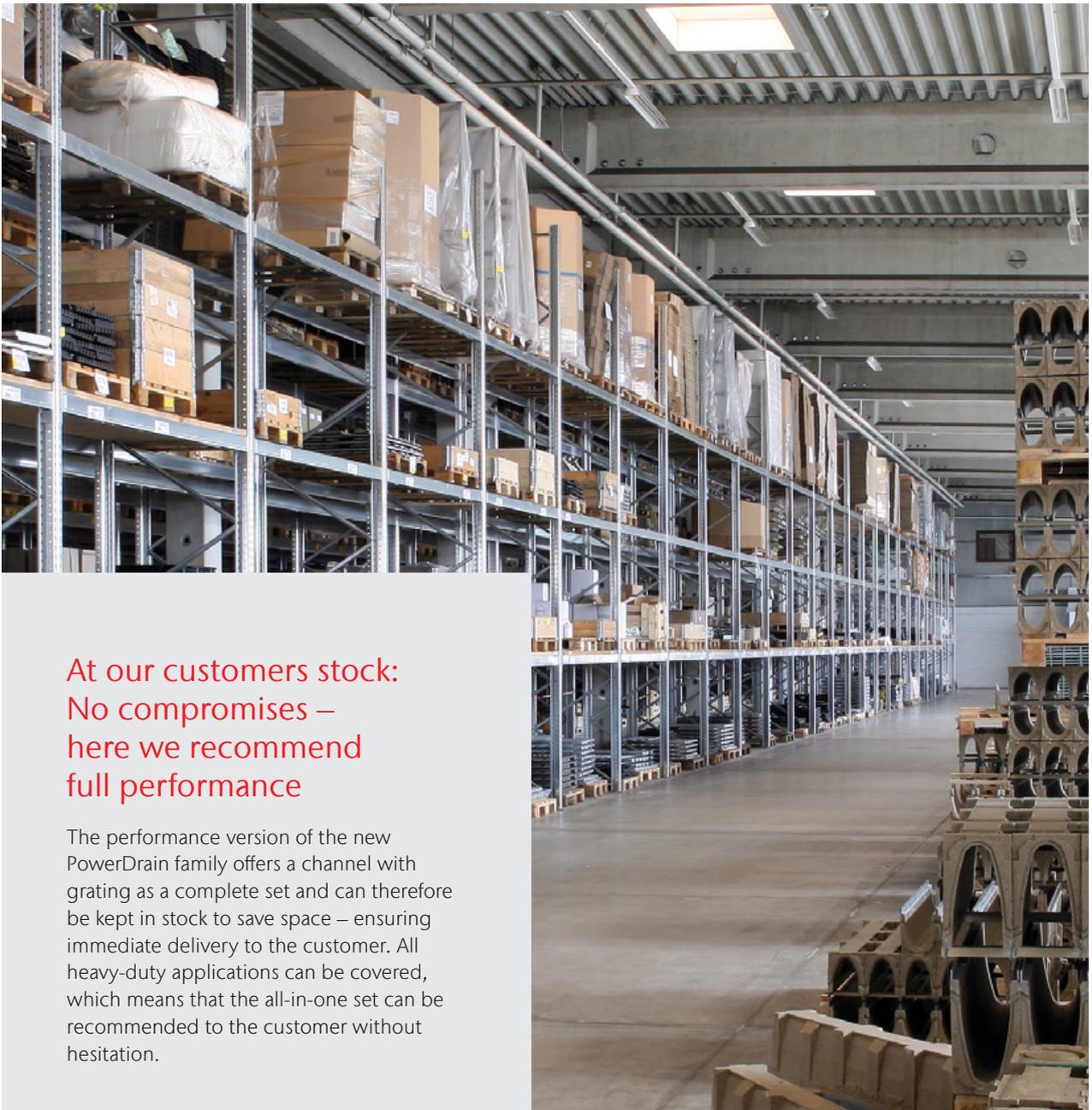
The cast iron edge rail and grating are equipped with the well-known high-quality E-coating.





**On the construction site:  
easy to install thanks to  
a strong combination of  
strength and technology**

With the all-in-one set you save yourself an extra work step, the grating is already securely placed in the channel. This provides extra stability during installation



**At our customers stock:  
No compromises –  
here we recommend  
full performance**

The performance version of the new PowerDrain family offers a channel with grating as a complete set and can therefore be kept in stock to save space – ensuring immediate delivery to the customer. All heavy-duty applications can be covered, which means that the all-in-one set can be recommended to the customer without hesitation.

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## Handling of ACO PowerDrain components in detail

### PowerDrain

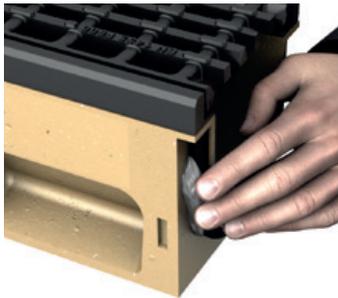
The PowerDrain system consists of thoughtfully designed components with some refinements for quick installation. Our ACO sales and consulting team is always available to answer any further questions you may have.

# System elements and their handling



## Installing the channel

During installation apply special ACO silicone to the integrated EPDM seal to ensure a tight connection



- ACO silicone grease for the seal

## Connecting a channel to the sump unit (NW 100)

Connection adapter is included in the delivery of the sump unit. NW 150/200 use sump units without adapters.



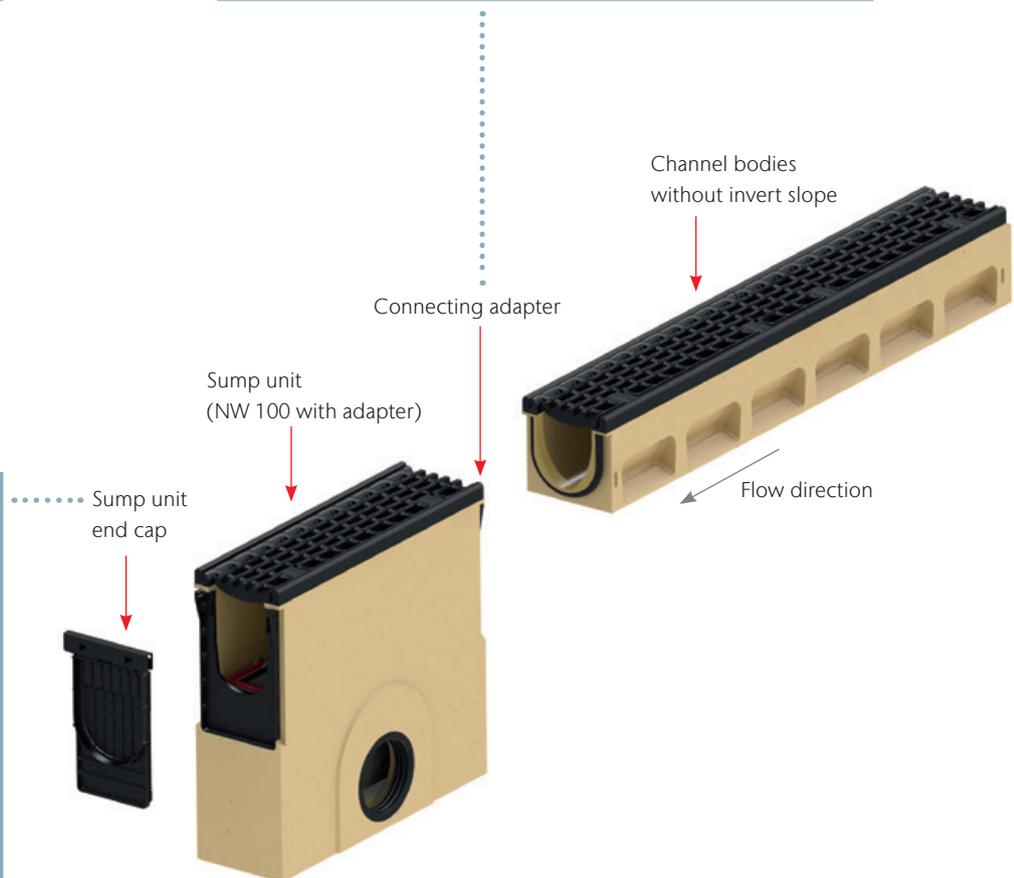
- Shorten the connection adapter according to the type of channel being connected.
- push all the way up
- press on and snap into place

## Installing the end cap on the sump unit (NW 100)

The end cap for the sump unit is included as part of the delivery of the sump unit. If one side of the sump unit is not connected to a channel it must be closed off with an end cap.



- push to the boundary
- press on and snap into place



**Making fitting pieces**

For custom construction lengths, channel bodies can be cut to size with a diamond cutting disc. Polyester adhesive permanently bonds the cut pieces. The same applies to the adapter for changing the flow direction.



End cap for channel end with lip labyrinth seal (LLS) for horizontal watertight pipe connection



Adapter for change of flow direction



shortened channel body



Half metre channel body without sloped invert



Adapter for corner, T- and cross-connections



Multifunctional closing end cap made of polymer concrete



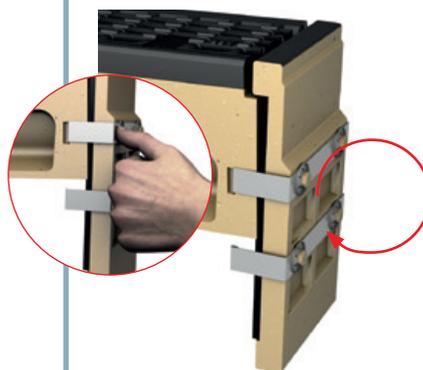
**How to prepare a cross section**

Pre-drill the side opening on the half-metre element and knock it out with a hammer and chisel. Then glue the channel and adapter together.



**Multifunctional closing end cap for channel start and end**

Turn the end cap by 180 degrees to ensure an exact fit on the inlet and outlet side.



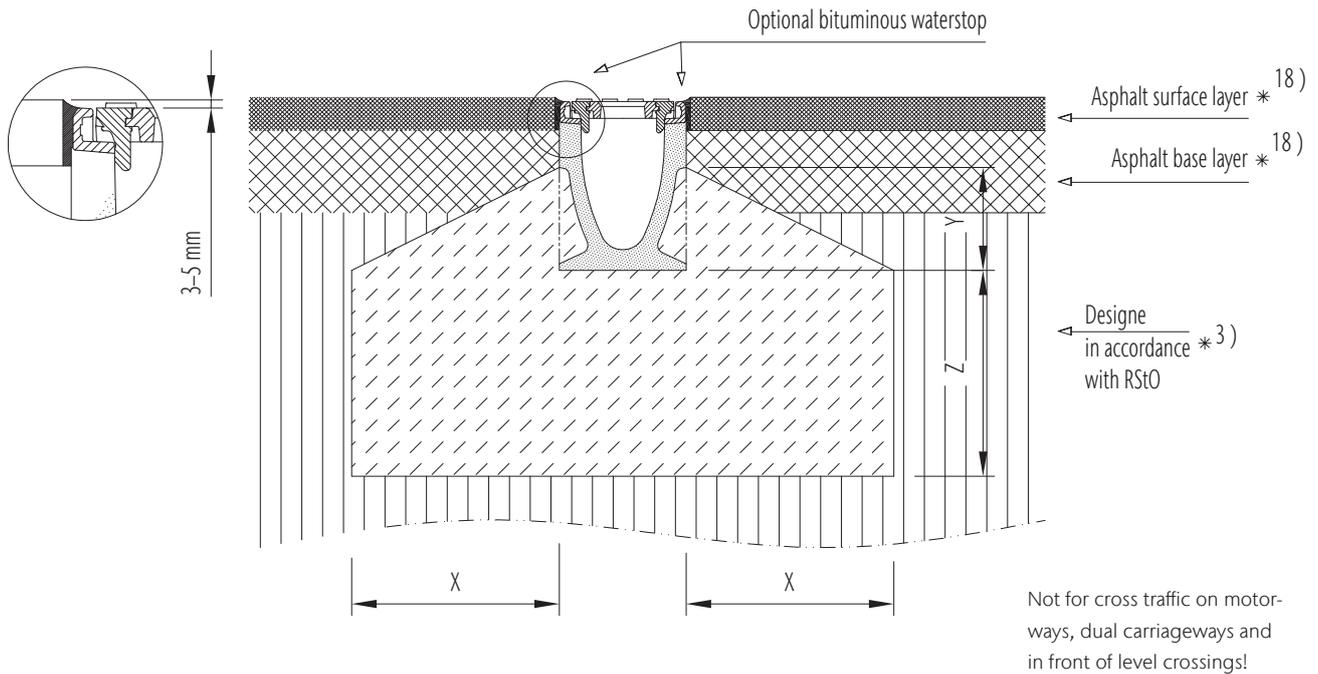
- snap into recess
- for all heights

# Channel body installation

Select an installation example that fits to your market needs

## Installation in asphalt - Class A 15 to D 400

for extreme loads see index list \*7 and installation E 600



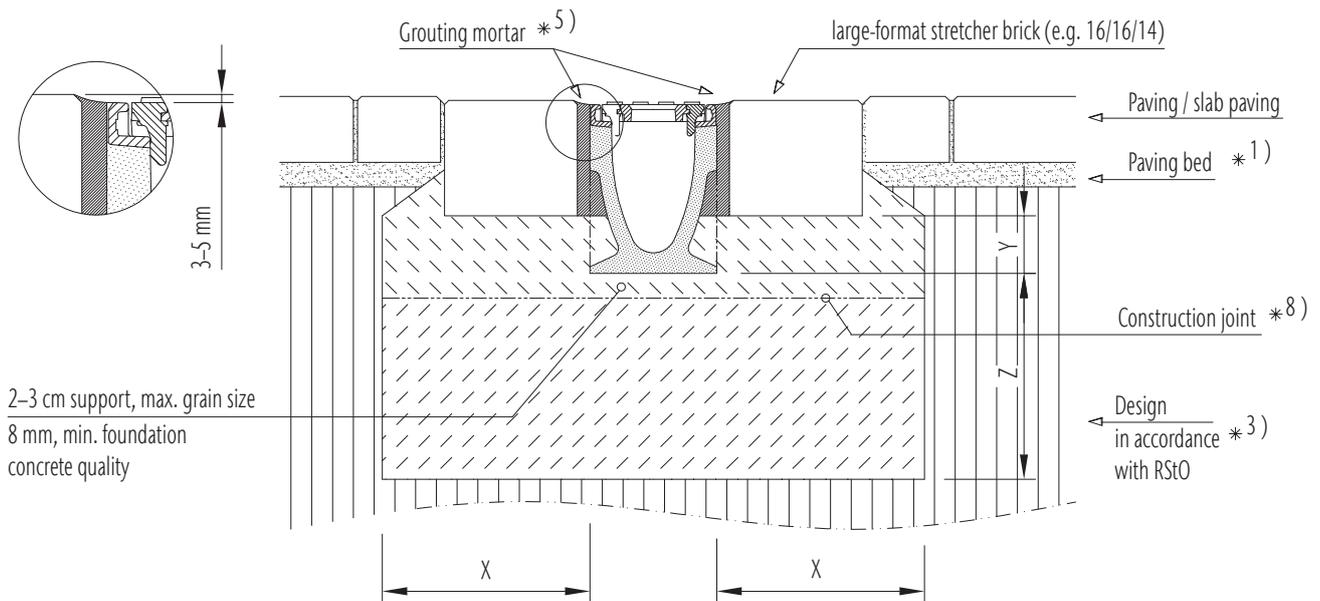
Class		A 15	B 125	C 250	D 400	E 600
<b>Compressive strength class for foundation concrete</b>	(according to BS EN 1433)	≥ C 12/15	≥ C 12/15	≥ C 12/15	≥ C 25/30	object-specific
<b>Exposure class of foundation concrete * 16)</b>	(according to BS EN 206 -1)	(X0)	(X0)	(X0)	(X0)	on request
<b>Foundation dimensions – type M</b>	(according to BS EN 1433)	<b>x [cm]</b>	≥ 10	≥ 10	≥ 15	≥ 20
	<b>y [cm]</b>	Half height channel element			Top edge of anchoring pocket*2	
	<b>z [cm]</b>	≥ 10	≥ 10	≥ 15	≥ 20	

Applies only in combination with the general preliminary remarks and the index list of our installation instructions!

Drawing G1-E01-784-3, version 01.21

## Installation in pavement - class D 400 to E 600

for extreme loads see index list \*7 and installation in concrete



Not for cross road drainage!

Class	A 15	B 125	C 250	D 400	E 600
<b>Compressive strength class for foundation concrete</b>	(according to BS EN 1433)			≥ C 25/30	≥ C 25/30
<b>Exposure class of foundation concrete * 16)</b>	(according to BS EN 206 -1)			(X0)	(X0)
<b>Foundation dimensions – type M</b>	(according to BS EN 1433)			<b>x [cm]</b>	≥ 20
				<b>y [cm]</b>	Lower edge of the stretcher brick
				<b>z [cm]</b>	≥ 20

Applies only in combination with the general preliminary remarks and the index list of our installation instructions!

Drawing G1-E01-782-3, version 01.21



### Note

For more on the topic please refer to the detailed Installation Advice for ACO DRAIN® Line and Point Drainage

**Here you can place your local Call To Action Button**



Tip

References with pictures of the property and description of the drainage system

Here you can place your local Call To Action Button

# PowerDrain for all areas of use

When selecting the appropriate standardised load classes, the planner or installer is guided by the application of the drainage channels. If in doubt, always choose the higher class. The PowerDrain system can be used in even the extreme loads and in all areas of use.

## Application examples

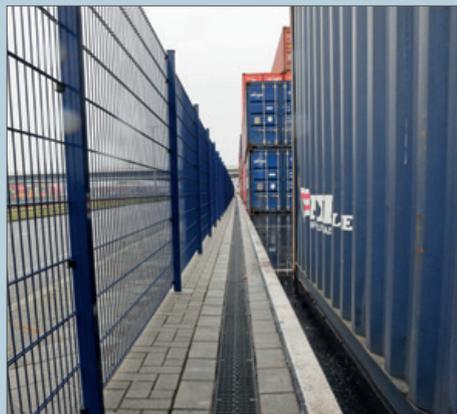




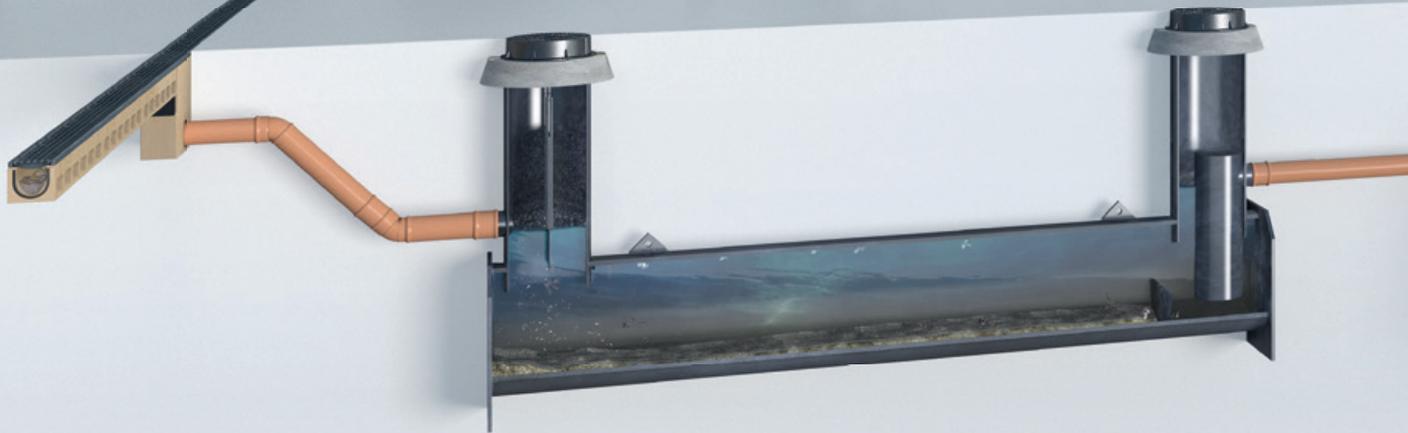
The ACO PowerDrain drainage system also offers appropriate solutions for facilities used for the storage, filling and handling of water polluting substances.

ACO application technology provides you with support for your construction project.

**Here you can place  
your local  
Call To Action Button**



4



How does surface water management and water protection begin?

How to achieve the right water quality?



**ACO surface drainage**

- Drainage channels
- Road gullies and yard gullies
- Gully tops
- Manhole covers



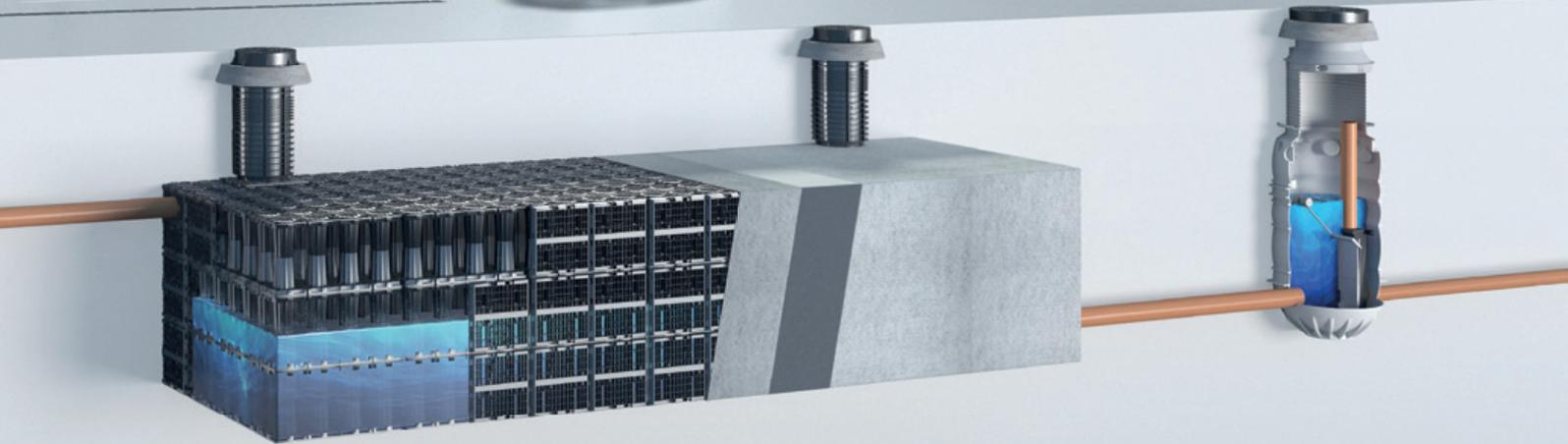
**ACO cleaning systems**

- Separators
- Sedimentation and filter systems

Your questions – our answer:

the ACO system chain

The ACO system chain supports you at every stage of drainage, rainwater management and treatment planning.



How to  
reduce surface  
runoff to a natural level?

How to  
control the discharge rate  
to the required level?



**ACO retention and storage systems**

- Emergency systems
- Infiltration and attenuation systems
- Surface water retention basin



**ACO control systems**

- Flow control systems
- Pump stations



The ACO **ACO system chain** creates the drainage solutions for the environmental conditions of tomorrow.

## Quality starts with the material

When designing building elements, selecting the correct, suitable material determines the aesthetics and functionality. The materials used by ACO are characterised by their strength, their ageing resistance and their resistance to aggressive media, frost, heat and sunlight. Due to their long service life and recyclability, they are both sustainable and environmentally friendly and are utilised for their intended purpose.





## Polymer concrete

One step ahead

The special material composition and state-of-the-art production technologies provide ACO polymer concrete with its outstanding property profile. The ACO polymer concrete products have high strength values and a lower weight. ACO polymer concrete is impermeable to water. Water dries off quickly. Frost damage is not possible. The smooth surface area of ACO polymer concrete enables water and dirt particles to flow off quickly and is easy to clean. In addition, polymer concrete is resistant to aggressive media even without additional coatings and is also versatile and durable even under extreme conditions.



## Cast iron

Quality for all requirements

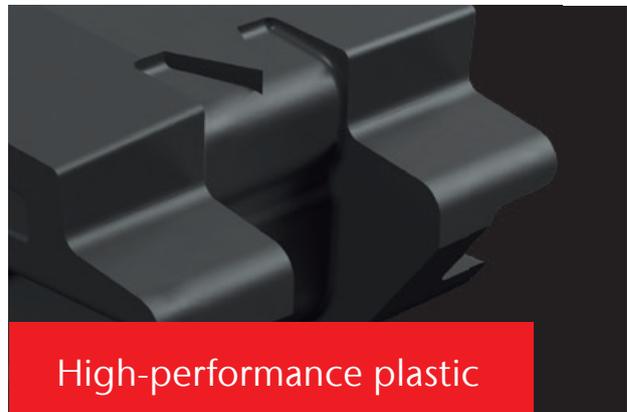
The types of cast iron used in the ACO Guss factories in Kaiserslautern and Aarbergen are adapted to the constantly increasing requirements through intensive innovation and development processes: both cast iron with flake graphite (grey cast iron GJL) and cast iron with spheroidal graphite (spheroidal graphite cast iron GJS) have proven themselves as materials for use in channel casting due to their high corrosion resistance. ACO Guss provides the optimum solution for the respective application, independent of the material used. ACO products receive additional corrosion protection, for example, with cathodic dip E-coating.



## EPDM – for the seal

Durable and secure

The most varied weather conditions such as thermal effects cause conventional materials and systems to age quickly. This is where synthetic ethylene-propylene-diene-monomer rubber, EPDM, shows its strength. Due to its molecular network structure, the material combines flexibility and durability. It was not without reason that the process for producing EPDM was awarded a Nobel Prize in 1963.



## High-performance plastic

Innovative and flexible  
down to the last detail

Plastic components provide the highest-possible design freedom in mould shape and function. We use this potential to prevent complex material combinations and joining processes and to develop intelligent solutions “from a single source” instead. The plastics utilised by ACO are characterised by their high breaking strength as well as their excellent resistance to environmental influences.

# Our service offer

Each project is different and has its own specifications and challenges. Aside from our products, we can also offer you our know-how and services, so we can develop tailor-made solutions together – from planning to support after completion.



train

## Information and Further Education

In the ACO Academy we share the know-how of the world-wide ACO Group with architects, planners, processors and traders, for whom quality is important. You are invited to share these benefits.



design

## Planning and Optimisation

The specification and design of drainage solutions allows many variations. Yet which concept produces the most profitable and technically most reliable solution? We help you to find the right answer.



support

## Construction consultation and support

To ensure that no unpleasant surprises occur between the planning and implementation of a drainage solution, we advise and assist you for a specific project on your construction site.



care

## Inspection and Maintenance

ACO products are designed and produced for a long life. With our after-sales offers we ensure that ACO fulfils your high quality standards for many years.



train



design



support



care

## ACO service chain

ACO is your first point of contact in all project phases.

Any questions?

askACO



Our invitation for you: askACO

Together we will find the right solution  
to your specific drainage requirements.  
[www.aco.com](http://www.aco.com)

Here you can place  
your local  
Call To Action Button

### ACO drainage systems for roads and highways

As a global market leader in drainage technology, ACO has set itself the challenge of developing special products for road and highway construction and its associated infrastructure. The diverse range of climatic conditions and the respective local variations require solutions that are both ecological and economical. ACO drainage systems include not only standard products, but also solutions that

are created specifically to suit the needs of particular projects. In addition to our products, we are proud to offer our experience and service, which allow us to work with you to develop customised solutions. ACO's technical expertise is always on hand when you need it. From the initial designs to commissioning and everything in between, our engineers are here to help you.

[www.aco.com](http://www.aco.com)

Every ACO product supports  
the ACO system chain



- 
- Drainage channels
  - Road and yard drains
  - Gully tops
  - Manhole covers
  - Rainwater treatment
  - Infiltration and attenuation
  - Pump shafts
  - Flow control systems
  - Tree protection
  - Amphibian protection
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