

ACO WaterCycle expertise for tomorrow's airports

ACO product solutions
on airside, building and landside





airside

ACO on the apron

- Drainage channels
- Cable shaft access covers
- Heavy duty manhole covers
- Light-oil separators

ACO WaterCycle expertise for tomorrow's airports

2

As one of the world market leaders in surface water management, ACO has the experience and innovative power to develop proper solutions for the extreme requirements in modern aviation. Our products enable airport designers and operators to increase comfort and safety in many different fields.





building

landside

ACO in airport buildings

- Stainless steel channels and drains for catering areas
- Sanitary drains with fire protection
- Bathroom drainage
- Roof and parking deck drainage
- Grease separators and grease management

ACO in front of the terminal

- Large area drainage
- Car park drainage
- Facade drainage
- Lights for directioning markers
- Access covers and top sections
- Infiltration, attenuation and flow control

Commitment to quality

Our modern, state of the art manufacturing plant produces high quality products which are used in world wide projects.

- KIWA – Third Party Control
 - ISO 9001
 - ISO 14001 and 50001
 - EN 1433
 - EN 124
 - Soil quality decree BRL 5070
- MPI Nord and MPA – Material Testing Institutes
- LGA – German Quality Institute
- GET – Quality Association for Drainage Technology
- DIBT – German Institute for Building Technology
- Member of the World Plumbing Council
- Member of German Sustainable Building Council



ACO. we care for water

ACO is a Water-Tech company that protects water. Building on our global drainage expertise that protects people from water, we increasingly see our mission as also protecting water from people.

With the ACO WaterCycle, ACO provides systems that collect and channel, clean, retain and ultimately reuse water. In this way, ACO contributes to the preservation of clean groundwater as a vital resource, and makes a contribution to tomorrow's world. In its Agenda 2030, the UN global community set the improvement of water quality as one of 17 sustainable development goals.

Intelligent drainage systems from ACO increasingly use smart technology to ensure that rainwater and wastewater are drained, or temporarily stored. With innovative separation and filter technology, we prevent water contamination by pollutants such as fat and grease, fuels, heavy metals and microplastics.

Today, ACO goes one step further: we accept the challenge of reusing water, and thus establishing a resource-saving cycle. For all products and systems, ACO attaches great importance to durability, reusability and a low carbon footprint. The pursuit of sustainability is an ongoing process that we strive to meet every day.

The ACO Group is a global family business that is one of the world market leaders in the Water-Tech segment. Founded in Schleswig-Holstein in 1946, it operates as a transnational network in over 50 countries. Worldwide, ACO is characterised by a high level of decentralised ownership, and explicit regional market proximity.

www.aco.com



Holder
Iver and Hans-Julius Ahlmann



Headquarters of the ACO Group
in Rendsburg/Büdelisdorf



5,300

employees in more than 50 countries (Europe, North and South America, Asia, Australia, Africa)

40

production sites in 20 countries



ACO Academy
for practical training

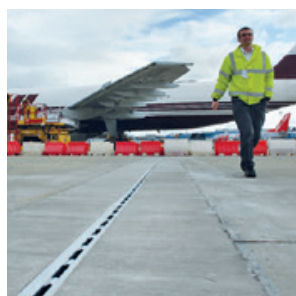


Airport applications

world-wide

selected ACO references

airside



- Odessa International Airport, Ukraine
- Fortaleza International Airport, Brasil
- Budapest Ferenc Liszt International Airport, Hungary
- Cataratas Del Iguazú International, Argentina
- Zagreb Franjo Tuđman Airport, Croatia
- Calgary International Airport, Canada
- Václav Havel Airport Prague, Czech Republic
- Abeid Amani Karume International Airport, Unguja in Sansibar, Tansania
- Palma de Mallorca Airport, Spain
- Frankfurt Airport, Germany

building



- Copenhagen Airport, Denmark
- Turkmenabat Airport, Turkmenistan
- Nelson Airport, New Zealand
- Santiago International Airport, Chile
- Zagreb Franjo Tuđman Airport, Croatia
- Shenzhen Boan International Airport, Guangdong, China
- Rome Fiumicino International Airport, Italy
- Emirate Chhatrapati Shivaji International Airport, Mumbai, India
- Washington Dulles International Airport, Washington D.C., USA
- Perth International Airport, Australia

landside

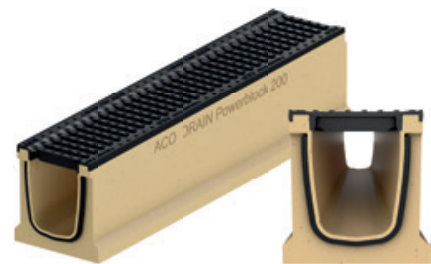
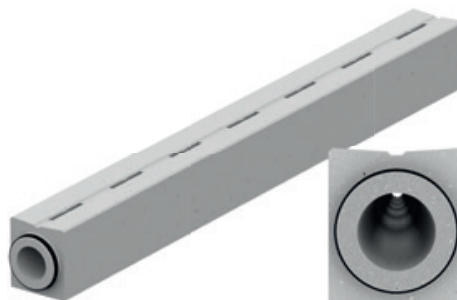


- Yinchuan Hedong International Airport, China
- Zaporizhzhia International Airport, Ukraine
- Dubrovnik Airport, Croatia
- Mostar International Airport, Bosnia and Herzegovina
- Brussels International Airport, Belgium
- Amsterdam International Airport Schiphol, Netherlands
- Marseille Provence Airport, France
- London Heathrow Airport, United Kingdom
- International Airport Brasilia and Rio de Janeiro International Airport, Brazil
- Melbourne Airport, Australia
- Munich Airport, Germany

For drainage in heavy-duty areas: ACO on the apron

What attributes does a channel need to withstand the weight of a 550 tonne airplane? What does heavy rain mean for the capacity of a drainage system? What happens to the surface water in refuelling areas? How can safe access be guaranteed to the supply and disposal pipes and cables?

The answers to these and many other questions are already integrated within all ACO product systems for heavy-duty applications.



Safety under extreme conditions – ACO Concrete slot channels

Aprons and taxiways at airports are ideal applications for ACO's famous 4 m long Pfuhrer concrete slot channels which combine all of the benefits of many years of concentrated experience in line drainage. They provide safe drainage under extreme conditions with high hydraulic capacities. The matching kerb slot channels ensure drainage of runways and aprons.

The heaviest duty channel – ACO DRAIN® Powerblock

ACO sets new standards in the area of heaviest loads. The ACO Powerblock is the solution for maximum loads and the highest requirements. Especially for applications of class F 900 and beyond. Maximum stability with high dynamic forces due to monolithic construction. Solid cast iron kerb, large inlet cross-section and high hydraulic performance even in heavy rainfall. Economical thanks to minimum required bedding concrete and direct application of the surface coverings.

Heavy load channels



Channel system from a single block – ACO DRAIN® Monoblock RD 100–300

The unique Monoblock design guarantees highest levels of safety and stability for large-area drainage solutions. An ideal alternative to conventional systems. The monolithic construction makes the Monoblock durable and stable even under extreme loads. The channel and the grating are cast in one piece from polymer concrete.



Customised drainage systems poured in situ – ACO CR Subframe

The rugged polymer concrete subframe is fitted with an extremely tough cast iron bar grating, specially designed for applications involving concrete drainage channels poured in situ. The gratings are firmly bolted to the polymer concrete to ensure permanent connection to the poured concrete surround. Integrated modules ensure uncomplicated installation and a wide range of layouts.



Retention channels



Controlling large volumes of water – ACO DRAIN® Qmax slot drainage

Rainfall on large paved areas can rapidly generate very high flow rates of several hundred litres per second. ACO Qmax with the continuous slot is specially designed for draining large areas such as airport aprons or extensive car parks. The large ovoid channel shape made of MDPE – a recycled polymer – optimises the flow rate. Ideal in water management solutions which require further treatment of the drained-off surface water.



ACO Qmax Neo width 300 and 600 are new members of the existing Qmax family. This effective option differs in terms of material, manufacturing and transport process. Due to the low component weight and the simple assembly of several channel bodies, a quick installation without additional lifting device is possible.

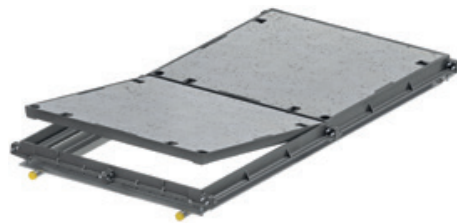
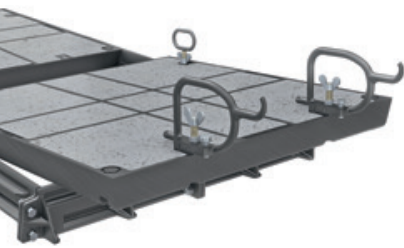


Covers

Flexible covers for shafts and utility ducts – ACO Access covers

ACO Passavant Detego access covers satisfy all of the technical safety criteria for airports. Applications include supply and disposal shafts, and material and inspection shafts.

The ACO Secant access cover is a flexible system with a range of combinable covers and frames and/or frame components. This ensures that the complete opening is accessible when the covers have been opened. Secant is available from load class B 125, D 400 up to heavy load class F 900.



The ACO Servokat access covers are the ideal solution when covers have to be moved frequently for maintenance and inspection work. The covers with assisted-opening can be easily operated by one person. The surface covering integrated within the top is completely variable to ensure full incorporation within the design concept at each location.

Special covers are used when conventional covers no longer meet the project-specific requirements. ACO Passavant Detego is a specialist in this area and offers a customised solution for every requirement at the airport. Manhole covers, floor access doors for heavy-duty areas, emergency exits and sealed surfaces, for telecommunications and for other areas of expertise are individually developed for your project.

Cable shaft covers

Surface-water-tight design – ACO Cable shaft covers

Only watertight shaft covers may be used in sealing surfaces – and only those that also have sealing systems that are resistant to substances present in polluted water. ACO Passavant Detego has a high-quality range of shaft covers that meet all requirements and at the same time are extremely operator-friendly. For example surface-water-tight cable shaft covers with a reinforced concrete frame or prefabricated triangular cable shaft covers with a height-adjustable reinforced concrete frame. All covers are available for load classes D 400 – F 900.



Note

You will find further **ACO Covers** in the landside section.

Surface water treatment

High performance for high demands – ACO Cleaning systems

Collected surface water from traffic areas and car parks at an airport contains substances that must not be allowed to enter the water supply or groundwater directly. If they are released into nature, this poses a risk to soil, groundwater and the environment. The collected rainwater must therefore be cleaned to prevent sediments from being discharged into the sewage system or into nature. Depending on the degree of contamination, different ACO sedimentation and filter systems are available.

The ACO Stormclean removes filterable substances, heavy metals and light liquids and can be used before infiltration as well as before discharge into water courses. The combination of sedimentation and a substrate filter form the basis. The core is a thick backwashable substrate layer that filters fine particles and precipitates and adsorptively binds dissolved pollutants.

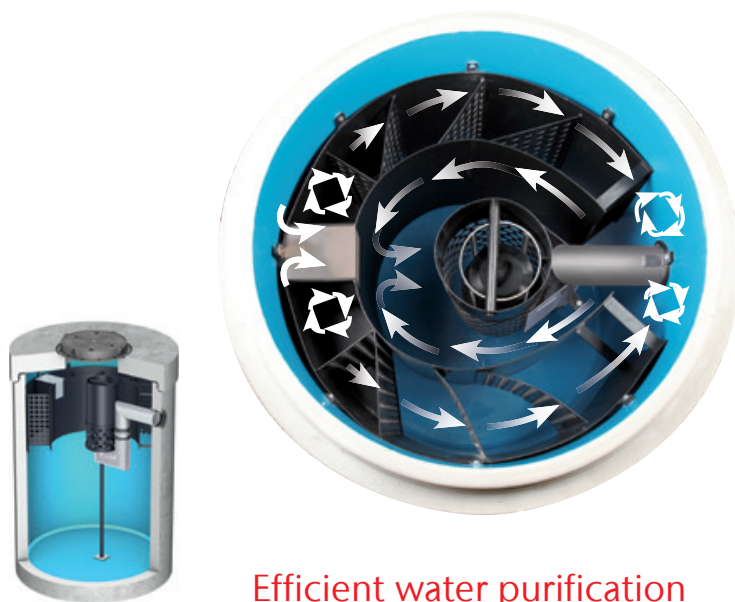
Because quality does not stop with the product: ACO Service supports you with customised ACO after-sales services that cover the entire life cycle of ACO products from general inspections to maintenance.



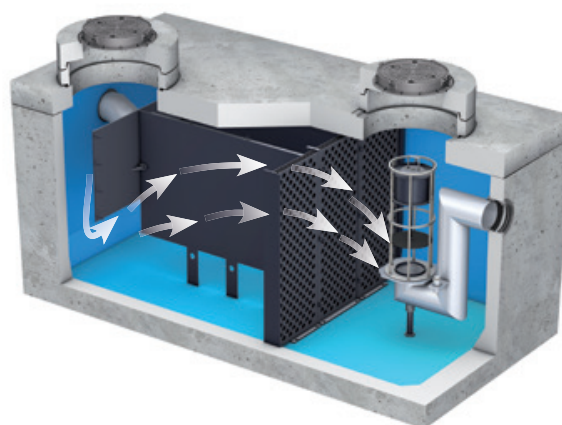


Environmentally-friendly solutions for water protection – ACO Catch pits, separators and pumping stations

The drainage pipe network beneath large aprons can often not accommodate the volumes of water quick enough after episodes of very heavy rain – ACO Rainwater catch pits act as buffer tanks to throttle the outfall. Residues from airport operations such as petroleum products must not pollute sewer networks. This can be prevented by low-maintenance and reliable ACO Light-oil separators which collect the separated-out materials. The ACO big tank system is used when large volumes of rain or groundwater need to be treated or contained. ACO Pump stations guarantee 100 % protection against backflow – even from flooded sewers.



Efficient water purification



For enhanced safety: ACO in airport buildings

Which solutions help optimise fire protection between storeys? How can the highest standards of hygiene be guaranteed in sanitation and catering areas?

Answers to these and many other questions are already integrated within the numerous ACO solutions for building services in terminals and service buildings.



Drainage in commercial kitchens – ACO Box channel hygiene

Drainage channels and floor gullies for industry and commercial kitchens must be hygienically faultless, safe for the staff, reliable in operation, and permanently durable. The design must also consider the in-situ sealing method, the connection of the floor covering, and the load. The combined channel-base developed by ACO is the perfect solution for hygienic and safe installation of thermal cooking appliances. The material of choice for floor drainage in commercial kitchens is stainless steel (material grade 304 or 316). Its most important benefits are its smooth surface and robustness.

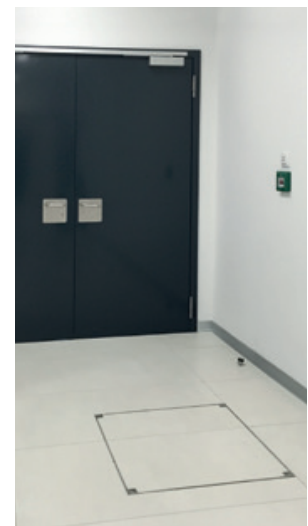


Grease disposal concepts – ACO Grease separators

All ACO Grease separators are manufactured pursuant to DIN EN 1825 and DIN 4040-100 standards, and satisfy international regulations. Separators are adaptable and available in a range of sizes and materials. The comprehensive product line includes ground installation or free standing separators. A modular complete package for the subsequent treatment of greasy gastronomy wastewater can also be used: the ACO Biojet wastewater treatment plant. Depending on the specific product solution, this system can reduce lipophilic contaminants to min. 80 mg/l. Many years of experience and in-depth technical expertise guarantee fully developed and tested separators with guaranteed quality standards.

Tested Safety – ACO Access covers for internal areas

Floor coverings always have to fulfil the highest standards regarding accessibility, safety and durability. ACO Manhole covers can fulfil these requirements optimally. They are utilised for applications regarding shafts for supply, disposal and inspection. The covers fit in perfectly with their surroundings and are almost invisible in internal areas. The filling materials which are installed in the covers must always comply with the associated traffic requirements. ACO Manhole covers are tested according to DIN, fulfil all the specified requirements and are available for load classes A 15 (L 15), B 125 (M 125) and C 250. This therefore means that covered openings always remain completely accessible.





ACO Roof gullies for gravity drainage and vacuum drainage

ACO is also successful with practical solutions for open channel drainage as well as syphonic drainage. The ACO Spin modular system consists of high capacity heatable flat roof drains made of cast iron and stainless steel for open channel drainage – with a capacity of up to 21.2 l/s. Syphonic drainage guarantees even higher drainage capacities – particularly for large roof surfaces: the special functional components ensure complete draining of the rainwater pipes. The ACO Jet underpressure/modular system made of cast iron and stainless steel achieves drainage capacities of up to 38.9 l/s. Fire protection inserts are available for both drainage systems and give modern roofs the necessary security.



Cast iron fire protection floor gullies – ACO Passavant floor gully

The “preventive fire protection in the area of floor gullies” is a very important subject when designing and constructing airport terminals. ACO has been involved with effective fire protection solutions for technical building equipment for many years and provides the correct solution for such instances with the Passavant cast iron floor gully. The material utilised in this product belongs to building material class A1. The ACO Passavant floor gully does not introduce any additional fire load into the building in such cases. The ACO Fire protection set and smoke stop also ensure maximum safety. The fire protection, technically-related suitability for the ACO Passavant floor gully, with a fire protection resistance duration of 30–90 and/or 120 minutes, has been determined by fire protection tests as a basis for the official general building approval (Paragraph Z-19.17-2144).





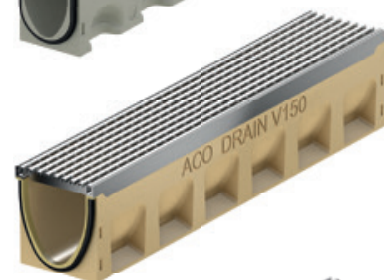
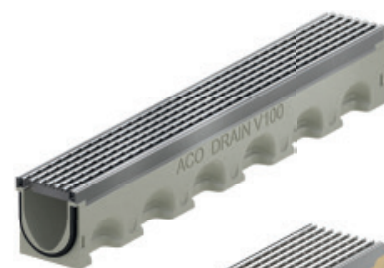
For perfect infrastructures: ACO in front of the terminal

How can surface drainage and way markings be intelligently combined? Which materials, dimensions and surfaces satisfy the demands of modern architecture? How can parking decks be safely drained even under extreme weather conditions?

Answers to these and other questions are integrated within the wide range of ACO drainage systems for green spaces and traffic areas.

Material choice to suit your project – ACO DRAIN® Multiline family

The new developed ACO material NEXITE®, abbreviated NX, made from very fine mineral fillers complements the multi-material expertise in the ACO DRAIN® family and ensures flexibility and cost-effectiveness. The channel bodies of the Multiline NX made of NEXITE® and the Multiline Seal in made of polymer concrete guarantee high functionality and extreme durability. Aesthetic variety is provided by frames made of steel, stainless steel, cast iron and plastic, paired with a range of different Drainlock gratings for all classes.



Drainage and design – ACO DRAIN® Slotted channel

Discreet and restrained, the slotted channel opens up new opportunities for space planning in airport forecourts. The narrow slot replaces the grating, and forms a clear, discreet line in the paving. This elegant slot can be used as a design element emphasising the lines of the architecture. The slotted frame for instance can be integrated discreetly and elegantly within steps.



Illuminating the drainage channel – ACO Lightline, Lightpoint and Eyeleds

Creating bright accents within architectural features and open spaces – and also acting as unmistakable way markings for paths. Lightline supports variable colour effects to open up numerous applications for planners in designing the colour dimension of outdoor spaces within airport complexes. Big Lightpoints or smaller Eyeleds are particularly beneficial for enhancing the attraction of areas frequented by heavy traffic.





Parking drainage

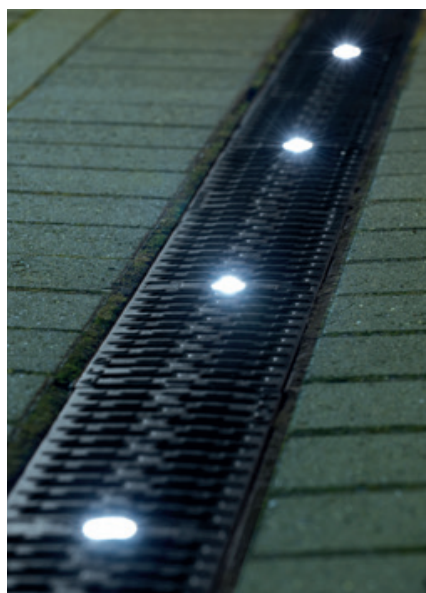
Park deck drainage – ACO Park deck channels and gullies

ACO has developed an optimal solution to protect indoor and outdoor multi-storey car parks safely and permanently against moisture, so that they are therefore resistant to mechanical, chemical and weather-related influences. A secure, permanent water-tight seal, also in the connection area, noticeably extends the maintenance interval – the building fabric remains intact for a longer time.

The ACO Park deck channels made of stainless steel and the ACO Park deck gullies made of cast iron correspond to building material class A1 and do not introduce any additional fire load into the building. If fire protection is required, then the channel can be installed in conjunction with the Passavant flat roof gully and the fire protection cartridge. The tested fire protection insert corresponds to the R30 – R120 fire resistance classes.

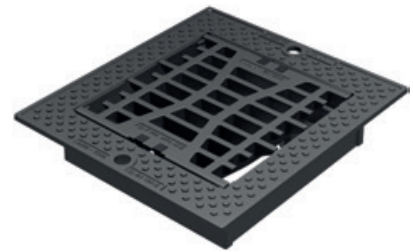
The ACO DRAIN® Decline P 100 channel system made of polymer concrete has been specially developed for draining park decks and underground car parks. The system is 100% leaktight and is therefore suitable for thinner ceiling constructions due to its minimal installation height. Load classes up to C 250 also ensure a long service life. The polymer concrete material is resistant to dirt, fuel, oil or road gritting salt in order to prevent corrosion and premature wear.

A corrosion-free and very cost-effective solution can be created when combined with slip-resistant ACO Microgrip plastic composite gratings.





Gullies



Flexible lightweights for roads – ACO Road drains

Operational safety, durability and cost efficiency are the main criteria defined for airport infrastructure. The ACO Combipoint road drain system was specially developed to satisfy all the stringent criteria defined for roadside drainage. The benefits of this road drain include the absolute tightness of the PE drain body, and its low weight. The range includes a wet sludge version. The separation road drain (SSA) for minimising the amount of solids entering the drain, is an optional accessory rounding off the Combipoint system.

Rolling instead of paving – ACO Top covers Multitop Bituplan

The specifically developed ACO Top covers Multitop with System Bituplan are rolled directly into the asphalt and therefore level with the surface. They enable the economical installation of the asphalt layer right up to the kerb. Time-consuming and costly paved kerbs are therefore no longer necessary. Wide hydraulically optimised slots are particularly suitable for hydraulically demanding areas with large amounts of dirt due to leaves, green cuttings and waste. Available for load classes D 400–F 900.



Manhole covers



For tomorrow's infrastructure – ACO Manhole covers

With the Multitop range of manhole covers, top sections and inlet gratings, ACO satisfies all specifications pursuant to DIN EN 124/E DIN 1229. Intelligent product features such as lightweight covers and gratings, boltless locks, damping frame inserts, and hydraulic, optically attractive and technically sophisticated surface designs, underpin the ACO Multitop product line's high engineering standards.

The latest innovation is the PowerTop cover. To secure safe operation on land- and airside it is equipped with a dual hinge including an encapsulated pressure spring. To protect the ground water against pollution by hazardous liquids like oil and gas the cover has an integrated seal as a standard. The cover is available as a class D 400 version for landside and an F 900 version for airside applications.



These covers you won't find at any other airport

With design covers, ACO offers the option of customising the surface of manhole covers with a company logo or similar motifs.

- With/without vents
- Clear width 600/800
- Class D 400/F 900



Note

You will find further **ACO Covers** in the airside section.

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Infiltration and attenuation systems

Surface water management – ACO Stormbrixx

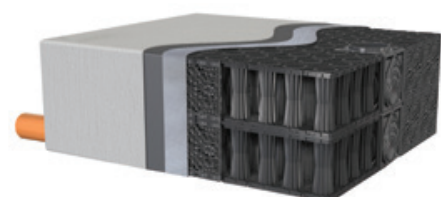
Modern airports frequently provide large, asphalted car parks for their passengers and staff. The modular ACO Stormbrixx infiltration system supports the natural water cycle. The collected surface water is retained underground and the percolation procedure releases it in moderate quantities into the ground.



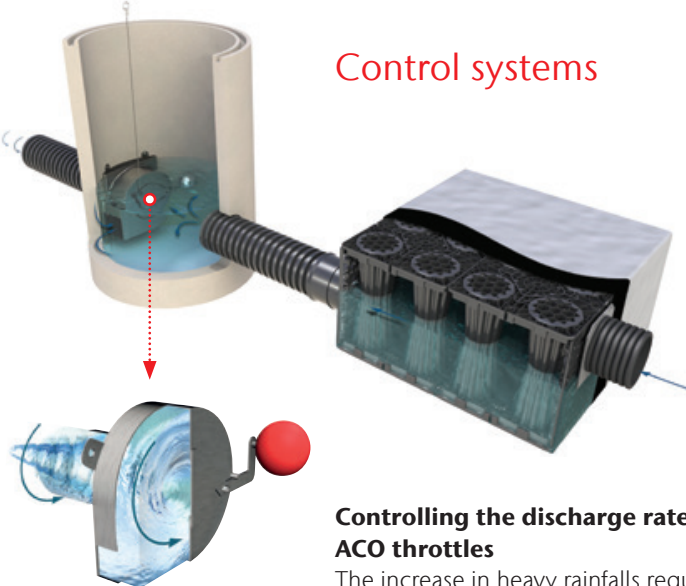
AskACO and get support with your project by ACO application technology during the planning process of the infiltration system.

askACO

- As a block infiltration system the ACO Stormbrixx releases the rainwater slowly to the ground.
- As block storage the ACO Stormbrixx discharges the water in a controlled manner, e.g. via throttle devices or pumping stations. Also applicable as reservoir for fire-fighting water: Water reservoirs and extraction shafts must be approved and accepted by the competent authority.



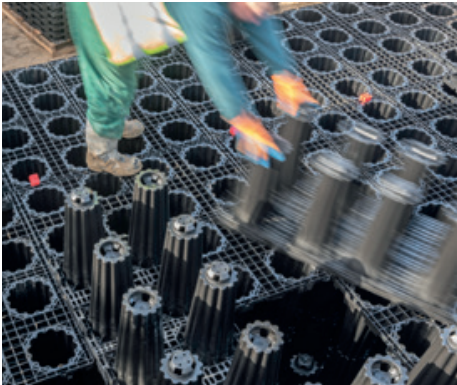
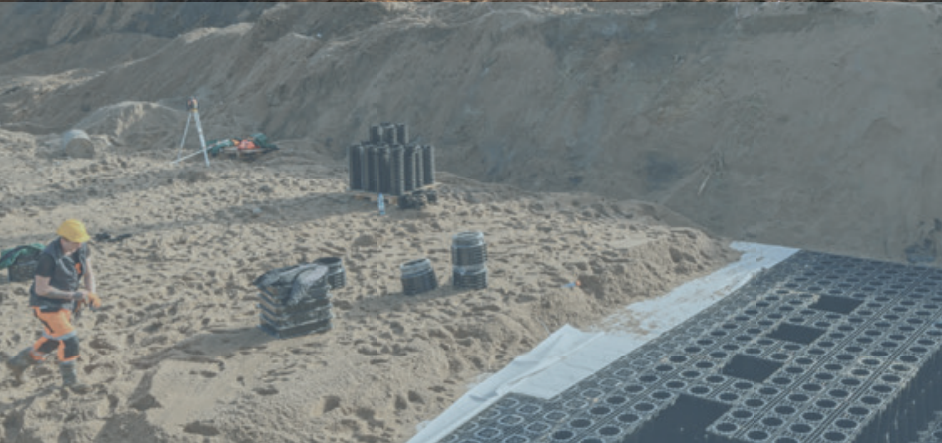
Control systems



Controlling the discharge rate – ACO throttles

The increase in heavy rainfalls requires a rethinking of drainage. If the basic requirements of infiltrating rainwater where it occurs cannot be met, retention and controlled discharge of rainwater to the public sewage system is essential.

Throttles as the ACO Q-Brake vortex throttle system may be used to flow control the release of the water from the storage into the watercourse. This helps to replenish groundwater levels and reduces the load on the sewage system.





Where surface water management and water protection begins

Achieving the right water quality



ACO surface drainage

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



ACO cleaning systems

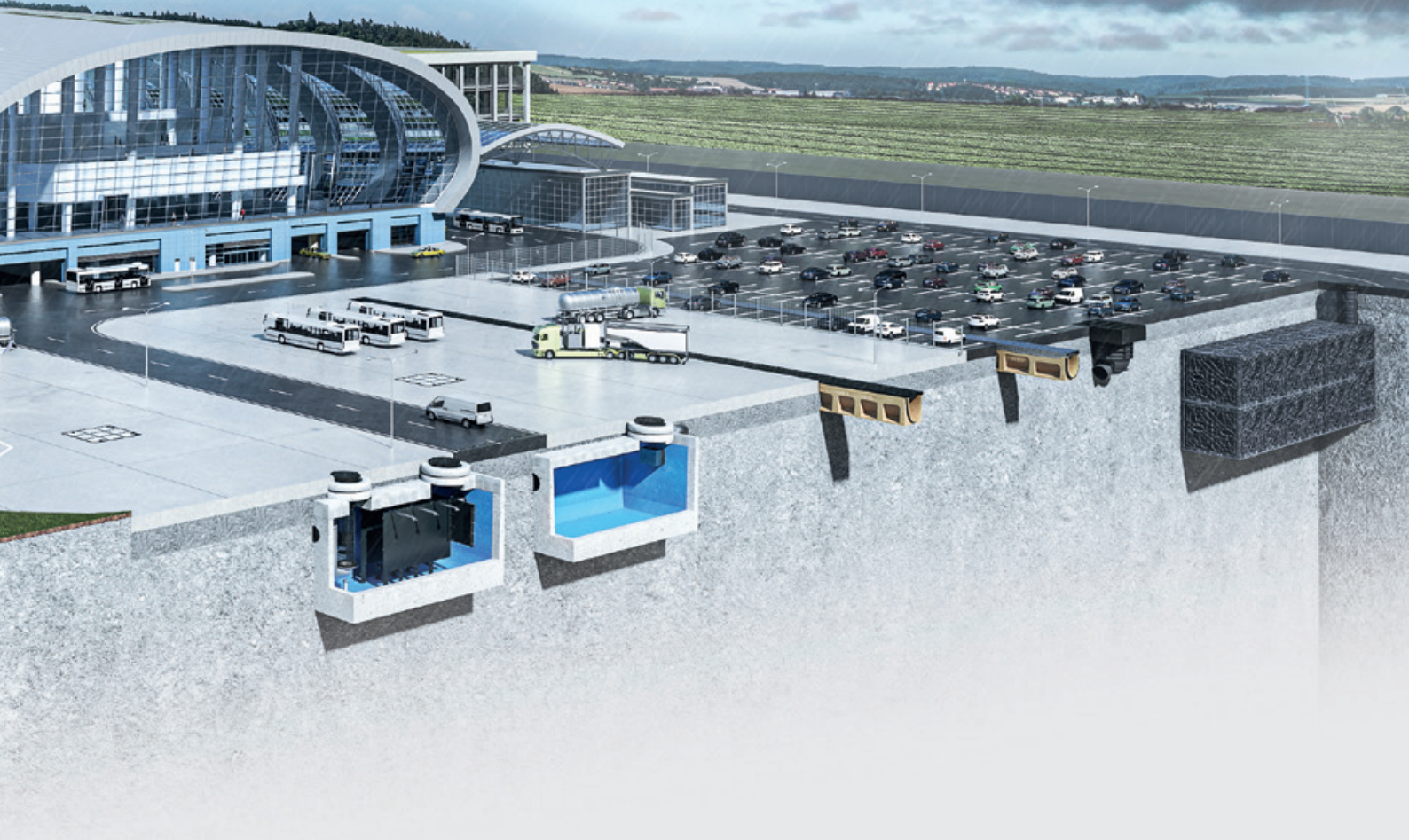
- Separators
- Sedimentation and filter systems

ACO WaterCycle



The ACO WaterCycle supports you at every stage of drainage planning.

This is rainwater management for the environmental conditions of tomorrow.



Reducing surface runoff to a natural level



- ACO retention and storage systems**
- Emergency systems
 - Infiltration and attenuation systems
 - Surface water retention basin

Control discharge rate to the required level



- ACO control systems**
- Flow control systems
 - Pump stations

ACO. we care for water

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.

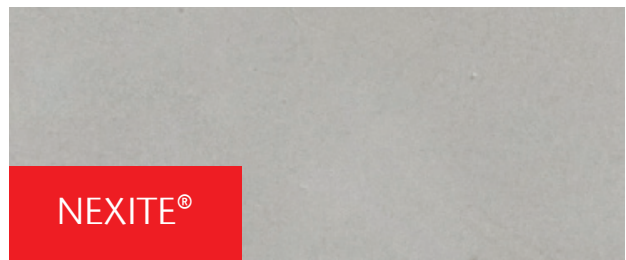
With 40 production locations worldwide, we consistently implement our ideas for product quality, economy and deliver reliability for our customers. Each of our factories has a special materials expertise, from which the entire ACO Group benefits. The fact that we are constantly updating our production technology and ecology to the latest state of the art is an integral part of our claim to act responsibly as a company and to be a global leader.



Polymer concrete

Durable and resistant

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.



NEXITE®

Concrete. A new generation

The newly developed ACO material NEXITE® (abbreviated NX) is composed with very fine fillers, which enable a high packing density. This results in particularly high strength and load-bearing capacity. The binders are used in accordance with the European Directive REACH on the protection of human health and the environment. This means that NEXITE® products support sustainable construction in the fields of public urban places, roads, infrastructure as well as heavy load applications. NEXITE® is 100 % recyclable and can be reused in the natural material cycle.



Steel/stainless steel

Sophisticated components

Both the processing of steel as well as stainless steel is a core competence of ACO in the various production facilities of the ACO Group worldwide. High investment sums ensure that our production facilities are always state of the art. The high qualification of the skilled workers ensures high product quality. Our own systems for surface protection and surface refinement are used, for example, in the production of ACO Drainlock gratings.



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.



Concrete

Durable and secure

In the field of tank construction for separation and drainage technology, concrete still plays a decisive role. ACO containers for drainage technology are made of high water impermeable concrete and have a very high resistance and stability. The containers can be used as separators, pumping stations, emergency systems or special shafts, and given an additional plastic coating or lining if required. ACO concrete tanks are therefore a durable solution for drainage and treating water.



Plastic

Innovative and flexible

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. Simple machining options and the low weight are the reasons for the outstanding user-friendliness of our plastic solutions.

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



train:

Information and Further Education

In the ACO Academy we share the know-how of the worldwide 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 in rainwater management allows many variations. We help you to find the right answer.



Our invitation for you: askACO

ACO is one of the global market leaders in the Water-Tech segment and has taken on the challenge of developing products that precisely meet the respective requirements. The diverse climatic conditions and specific local differences require solutions that are both ecological and economical in each individual case. Together we will find the right answer to your specific drainage question.

support:

Construction Consultation and Support

To ensure that no unpleasant surprises occur between the planning and implementation of a solution for rainwater management, 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.

ACO. we care for water

Intelligent drainage systems from ACO increasingly use smart technology to ensure that rainwater and wastewater are drained, or temporarily stored. With innovative separation and filter technology, we prevent water contamination. We accept the challenge of reusing water, and thus establishing a resource-saving cycle.

ACO Building Elements Ltd

www.aco.com.gr

