

ACO Product solutions for airports

Highest quality

for maximum safety





Airside

ACO on the apron

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

Highest quality

for maximum safety

2

ACO System chain – Product offering for airports

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.

- ISO 9001
- ISO 14001 and 50001
- EN 1433
- EN 124
- KIWA – Third Party Control
- 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. 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.

www.aco.com



Headquarters of the ACO Group
in Rendsburg/Büdelndorf



5,000

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

900 Mio.

Euro Sales in 2020

36

production sites in 18 countries



ACO Academy
for practical training

Holder
Iver and Hans-Julius Ahlmann



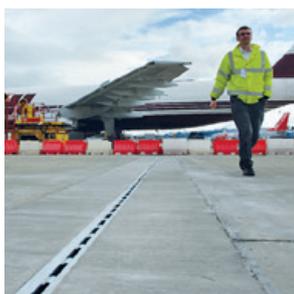


Airport applications

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
- Moscow Domodedovo, Russia
- Calgary International Airport, Canada
- Phoenix Sky Harbor International Airport, Arizona, USA
- Václav Havel Airport Prague, Czech Republic
- Abeid Amani Karume International Airport, Unguja in Sansibar, Tansania

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

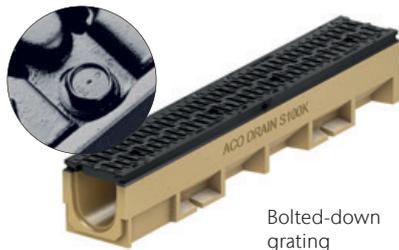


- Yinchuan Hedong International Airport, China
- Zaporizhzhia International Airport, Ukraine
- Dubrovnik Airport, Croatia
- Mostar International Airport, Bosnia and Herzegovina
- Brussels International Airport, Belgium
- Amsterdam International Airport Schiphol, Netherlands
- Marseille Provence Airport,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

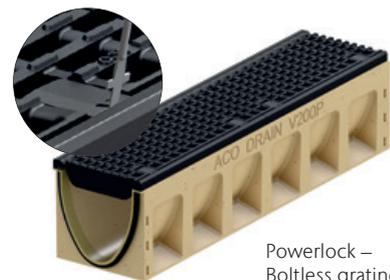
For drainage in heavy-duty areas: ACO on the apron

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.



Bolted-down grating



Powerlock – Boltless grating

Good to know

- ACO polymer concrete is extremely tough, very durable, and completely frost and de-icing salt resistant
- ACO channel systems are designed for use in load classes up to F 900 pursuant to EN 1433
- ACO channels with V cross-sections show much higher flow rates and have optimal self-cleaning properties

Safety under extreme conditions – ACO DRAIN® heavy-duty channels

Aprons and taxiways at airports are ideal applications for heavy duty ACO DRAIN® S 100 to S 300 systems which combine all of the benefits of many years of concentrated experience in line drainage. Safe drainage under extreme conditions with very high hydraulic capacities.

The heavy-duty channels are supplied with either a bolted-down grating or the ACO DRAIN® powerlock boltless locking system.

For heavy duty applications – ACO DRAIN® PowerDrain Performance

ACO has taken surface drainage for heavy load installations one step ahead: the 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 for active environmental protection.

The range is complemented by innovations in the self-locking, secure and quiet Powerlock grating with damping insert and cathodic dip coating for grating and frame.



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.

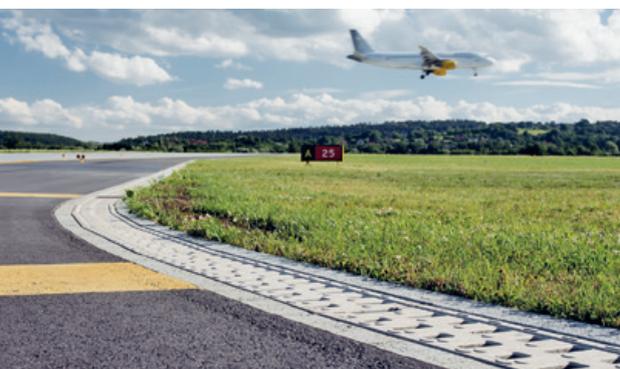


Controlling large volumes of water – ACO DRAIN® Qmax slot drainage

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 is a new subgroup 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.



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.



Covers

Flexible covers for shafts and utility ducts – ACO Access covers

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

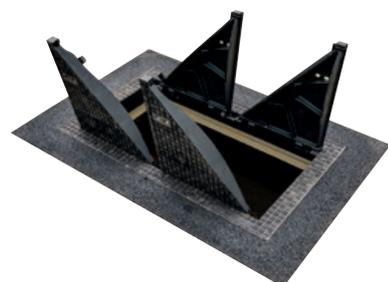
The ACO Servokat access covers are the ideal solution when covers have to be moved frequently for maintenance and inspection work. The covers with assisted-opening can be easily operated by one person. The surface covering integrated within the top is completely variable to ensure full incorporation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

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.



Cable shaft covers – surface-water-tight design

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 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 and also as Trigona Bituplan version for rolling in.

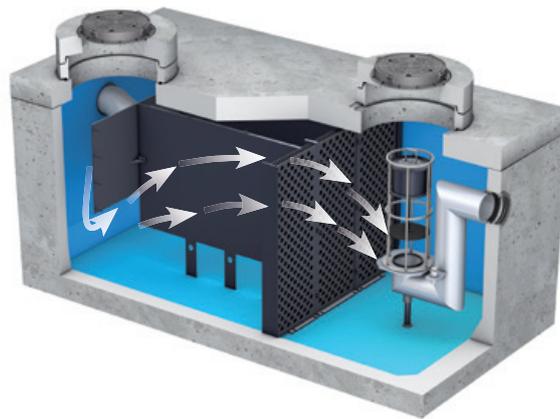
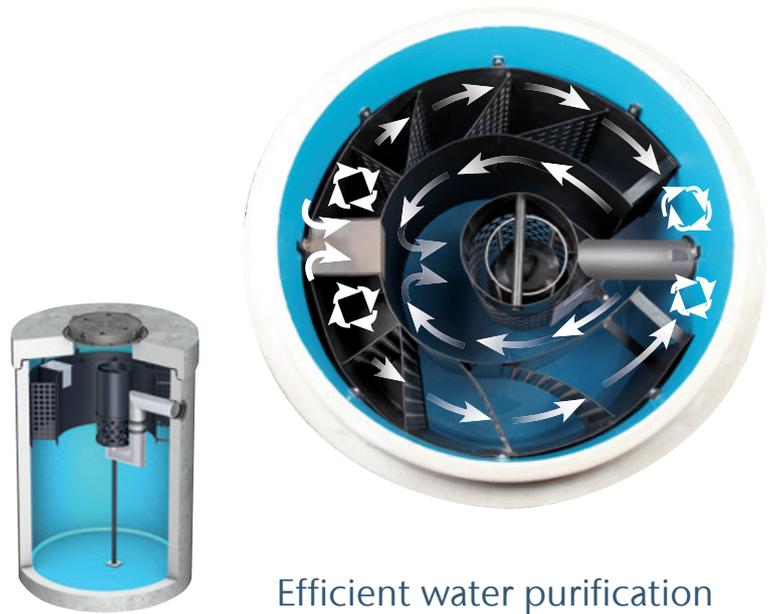


Surface water treatment



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.



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.

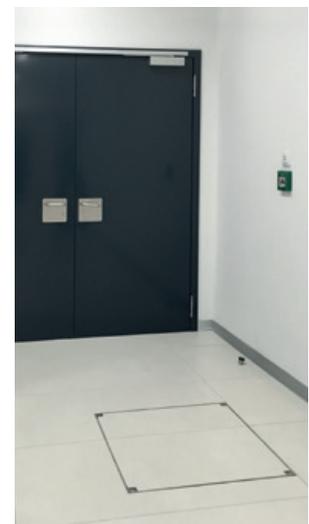


Grease disposal concepts – ACO Grease separators

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.

Intelligent design solution – ACO DRAIN® Multiline Seal in

The Multiline Seal in drainage channel integrates intelligent design with the V cross-section for high flow rates. The body of the channel and the details and materials of the rails and gratings combine aesthetic diversity, high functionality, and extreme durability. The system solution has an extremely varied range of covers. Gratings and rails are available to satisfy all load classes.



Drainage and design – ACO DRAIN® Slotted channel

Discreet and restrained, the ACO DRAIN® Slotted channel V 100 S/V 150 S Multiline open 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.



Illumination within the drainage channel – ACO Lightline, Lightpoint and Eyeleds

The ACO Lightline and Lightpoint or Eyeleds create bright accents within architectural features and open spaces – and also act 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.





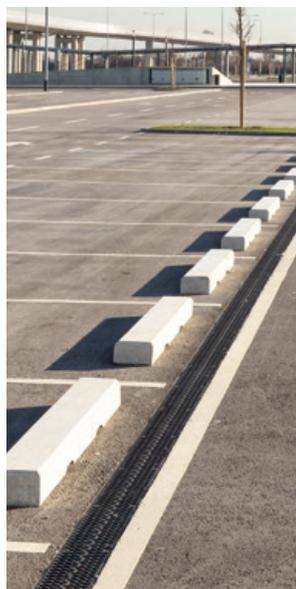
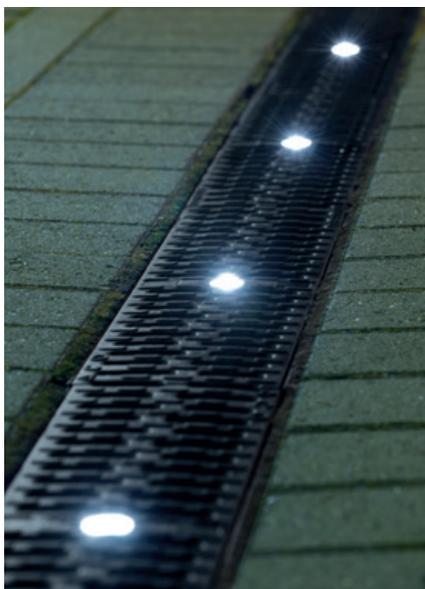
**Park deck drainage –
ACO Park deck channels and gullies**

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® Deckline 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 and manhole covers

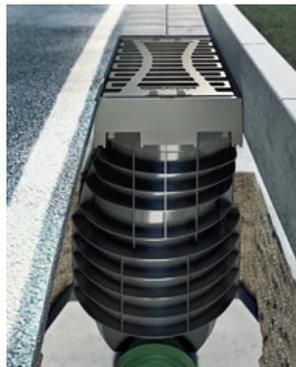


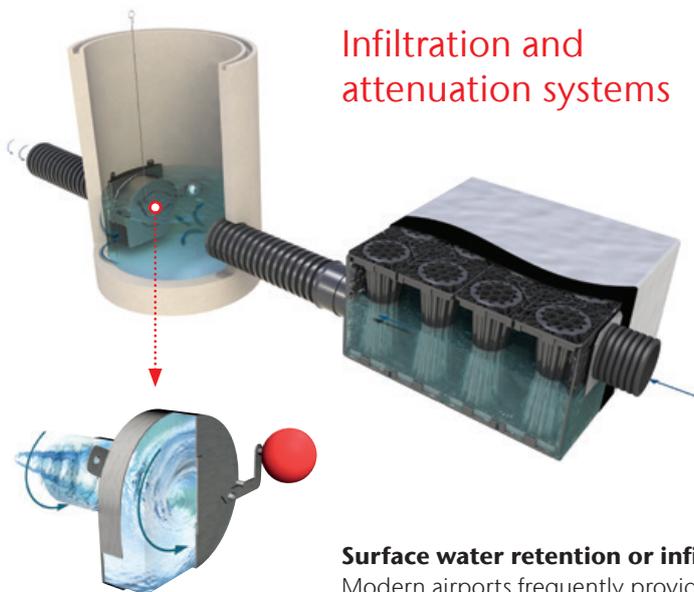
For tomorrow's infrastructure – ACO Road drains and manhole covers

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.

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.





Infiltration and attenuation systems



Surface water retention or infiltration

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 percolation procedure releases the surface water in moderate quantities into the ground. 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.





How does surface water management and water protection begin?



ACO surface drainage

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



How to achieve the right water quality?

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?



ACO retention and storage systems

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

How to control the discharge rate to the required level?



ACO control systems

- Flow control systems
- Pump stations



The **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.

With 30 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

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.



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.

The ACO service package for airport planners

Every project is different, with its own demands and challenges. In addition to our top products, we also make available our in-depth know-how and our services to assist you in developing individual customised solutions – from planning to service provision after completion.



train

Information and further training

ACO Academy shares the expertise of the global ACO Group with architects, planners, operatives and dealers who place priority on quality. We invite you to attend and benefit from this know-how.



design

Planning and optimisation

Tendering and planning for drainage solutions can be based on a range of possible options. But which concept produces the best economic and safest technical solution? We help you find the answer.



support

Construction advice and assistance

To ensure that there are no nasty surprises between the planning and implementation of a drainage solution, we can provide you with project specific advice and support at your construction site.



care

Inspection and maintenance

ACO products are designed and manufactured for long service lives. With our after sales service, we ensure that ACO fully satisfies its high quality standards even after many years of efficient operation.



train



design



support



care

ACO Service chain

In addition to personal consultation and training, ACO can also support you with a range of tools to help you simplify the planning, installation, servicing and maintenance of drainage systems.

Any questions?

askACO



Our invitation for you: askACO

ACO produces technical solutions for airport drainage – customised of course! Together we will find the right solution to your specific drainage requirements.

www.aco.com



Every ACO product supports
the ACO system chain



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- 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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