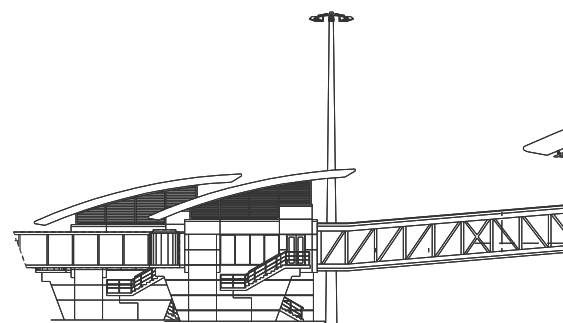
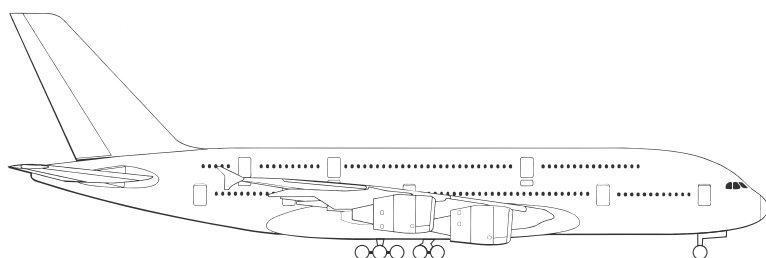




*Highest quality for maximum safety*

**ACO drainage systems for airports**





## Airside

### Highest quality for maximum safety –

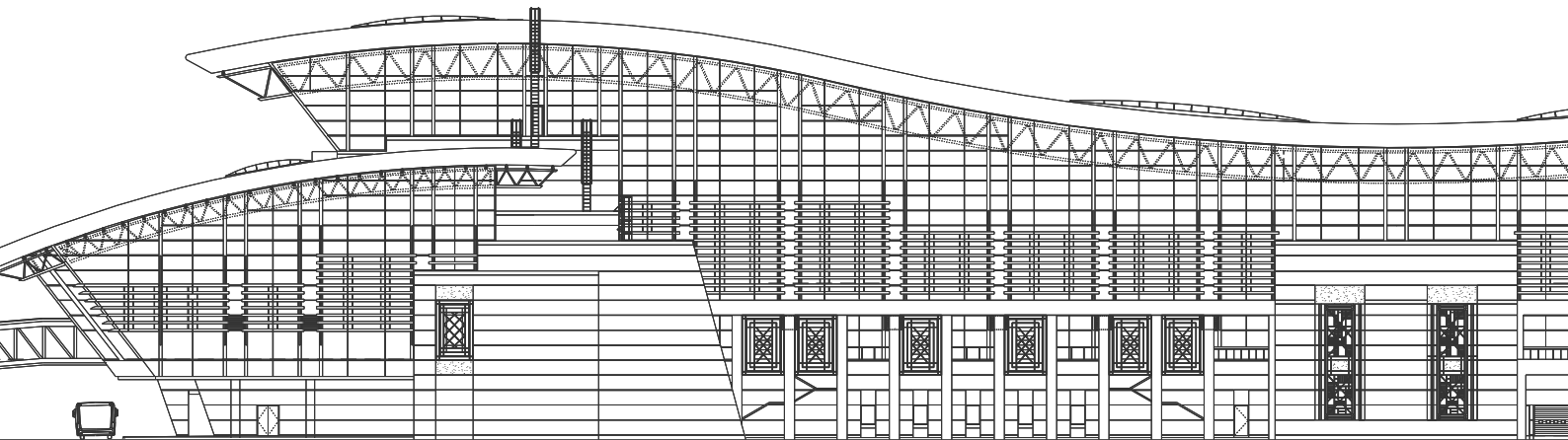
#### ACO drainage systems for airports

*As the world market leader in drainage, ACO has the experience and the innovative strength to realise solutions to satisfy the extreme demands of the modern aviation business. Our products help planners and airport operators enhance comfort and safety in many important areas. Our brand statement is therefore of real importance for people in the aviation industry: the ACO Group. A strong family you can build on.*

#### ACO on the apron

- Drainage channels
- Cable shaft access covers
- Light-oil separators





**Building**

### **ACO in airport buildings**

- **Separators**
- **Stainless steel channels and drains for catering areas**
- **Sanitary drains with fire protection**
- **Roof and parking deck drainage**
- **Bathroom drainage**



Image source: Fiaport AG



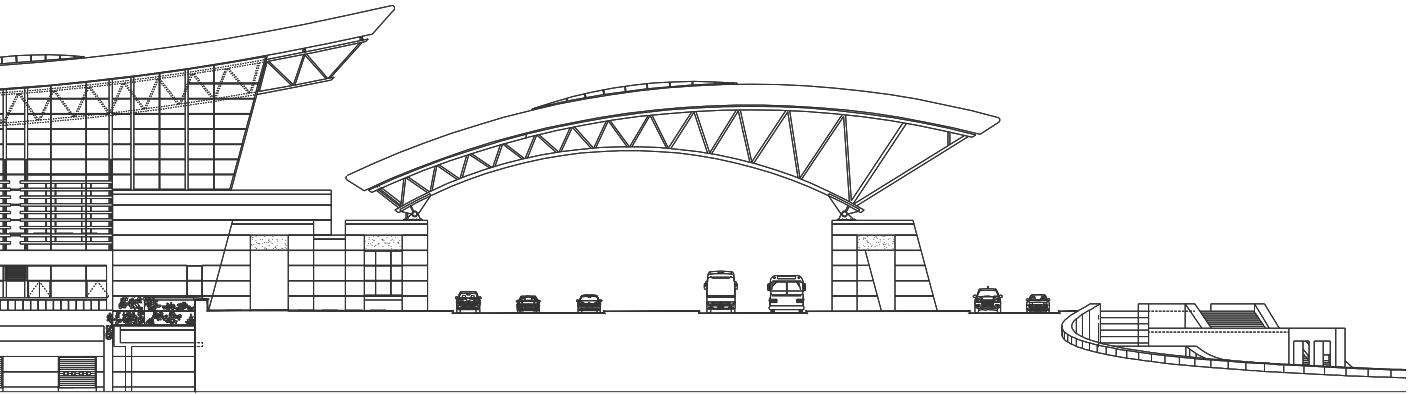
**kiwa**



**Commitment to quality**  
 Our modern, state of the art manufacturing plant produces high quality products which have been used in world wide projects.

- ISO 9001
- EN 1433
- EN 124
- KIWA – Third Party Control
- MPA – Material Testing Institute
- LGA – German Quality Institute
- LET – Quality Association for Drainage Technology
- DIBT – German Institute for Building Technology
- Member of the World Plumbing Council





Landside

### **ACO in front of the terminal**

- Large area drainage
- Car park drainage
- Facade drainage
- Lights for directioning markers
- Access covers and top sections



The Queen's Award for Enterprise 2006



**Airside**

**Building**

**Landside**



- **Frankfurt Airport, Germany**  
Aprons
- **Military Air Base Ramstein, Germany**  
Aprons
- **Paphos Int. Airport, Cyprus**  
Aprons
- **Larnaca Int. Airport, Cyprus**  
Access Covers
- **Domodedovo Int. Airport, Moscow, Russia**
- **Sheremetyevo Airport, Moscow, Russia**  
Aprons
- **Cairo Int. Airport, Egypt**  
Aprons
- **O.R. Tambo Int. Airport, Johannesburg, South Africa**  
Aprons
- **King Shaka Int. Airport, Durban, South Africa**  
Aprons
- **Queen Alia Int. Airport, Amman, Jordan**  
Runway
- **Chek Lap Kok Airport, Hong Kong, China**  
Drainage at Terminal Building and Baggage Hall

- **Eleftherios Venizelos Int. Airport, Athens, Greece**  
Olympic Hangars
- **Chennai Int. Airport, Madras, India**  
Oberoi Flight Kitchens
- **Indira Gandhi Int. Airport, Delhi, India**  
Floor Gullies
- **Lagos Airport, Nigeria**  
Catering Kitchens
- **Dubai Airport, United Arab Emirates**  
Emirates Catering Kitchens
- **Abu Dhabi Airport, United Arab Emirates**  
Catering Kitchens
- **Muscat Int. Airport, Seeb, Oman**  
Royal Flight Hangars
- **Chek Lap Kok Int. Airport, Hong Kong, China**  
Cathay Pacific Catering Kitchens  
Lufthansa Catering Kitchens

- **Hamburg Airport, Germany**  
Terminal Roads
- **Vienna Int. Airport, Austria**  
Parking Area
- **Copenhagen Airport, Denmark**  
Approach Roads
- **Eleftherios Venizelos Airport, Athens, Greece**  
Approach Roads
- **Sofia Airport, Bulgaria**  
Terminal Roads
- **Ruzyně Airport, Prague, Czech Republic**  
Terminal Roads
- **Frederic Chopin Airport, Warsaw, Poland**  
Terminal Roads
- **Beijing Capital Int. Airport, China**  
Parking Area
- **Ottawa Macdonald-Cartier Int. Airport, Canada**  
Terminal Roads

**For really heavy-duty applications: ACO on the apron**

*What attributes does a channel need to withstand the weight of a 550 tonne Airbus A380? What do the increasingly frequent episodes of very 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.*

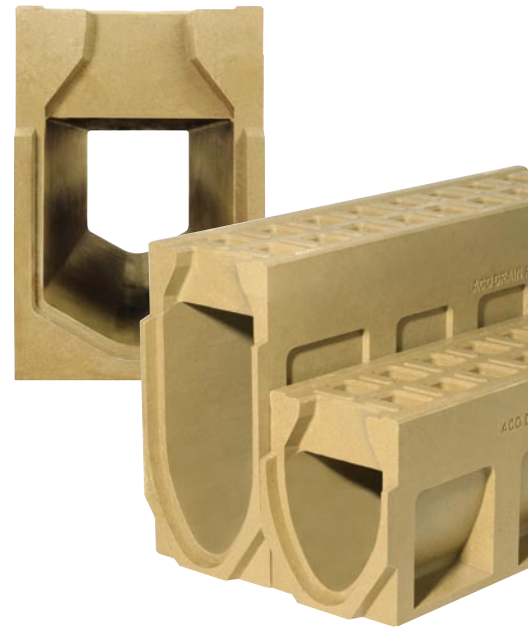
**Safety even under extreme conditions – ACO DRAIN® heavy-duty channels**

Aprons and taxiways at airports are ideal applications for heavy duty ACO DRAIN® S 100 to S 300 systems which boast 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.



**Slim and extremely efficient – ACO DRAIN® Powerdrain**

The benefits of this product line include a new nominal width system, universal stability, functionality and design freedom. The special elastomer damping system between the channel and the grating, combined with a securely locked but still flexibly-gripped grating, means long-lasting noise suppression to damp down the sound made by vehicles crossing the drain. The damping also protects the system from wear and tear – for more durability and longer lifetimes.



**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 Qmax**

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. ACO Qmax is an ideal module in water management solutions which require further treatment of the drained-off surface water.



- 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 boast much higher flow rates and have optimal self-cleaning properties

**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 Secant access cover is a flexible system with a range of combinable covers and frames and/or frame components. This ensures that the whole of the opening is accessible when the covers have been opened. 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 opened by one person. The surface covering integrated within the top is completely variable to ensure full incorporation within the design concept at each location.



**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.



**Customised drainage systems poured in situ – ACO CR Subframe**

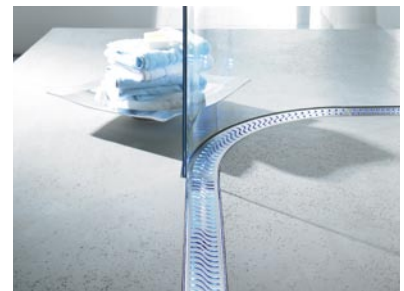
The rugged polymer concrete subframe is fitted with an extremely tough cast iron bar grating, specially designed for applications involving concrete drainage channels poured in situ. The gratings are firmly bolted to the polymer concrete to ensure permanent connection to the poured concrete surround.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



**For enhanced comfort and safety:**

**ACO in airport buildings**

*How can parking decks be safely drained even under extreme weather conditions? 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.*



**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. ACO grease separators are adaptable and available in a range of sizes and materials. The comprehensive product line includes grease separators for 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.

**Stainless steel channels and gullies – ACO Variant-CR**

Specifications for hygiene, surface properties, operating safety and material resistance are particularly high in catering areas. That is why drainage equipment used for these applications is made of stainless steel. ACO supplies a wide spectrum of stainless steel drains – gullies with nominal widths of DN 70, 100 and 150 can be combined with a variety of top sections. The stainless steel channel product line includes box channels and floor troughs in various dimensions, as well as attractive slotted channels. The Variant-CR floor drain range made of non-flammable stainless steel was tested pursuant to DIN 4102 and satisfies the certification criteria for fire resistance classes R 30 to R 120.

**Bathroom drainage in it's best form - ACO ShowerDrain**

Floor-level bathroom drainage systems made of high quality materials, boasting perfect finishing and outstanding design, in straight and curved versions, or with right angles, (and with optional lighting). Bathroom drains made of plastic or stainless steel integrated within a modular system create perfectly co-ordinated solutions for customised installation situations and areas of application. The fire protection solutions can also be used where required.



reddot design award winner 2009

The curved version of the non-illuminated ACO ShowerDrain won the iF product design award 2009 and the red dot design award 2009



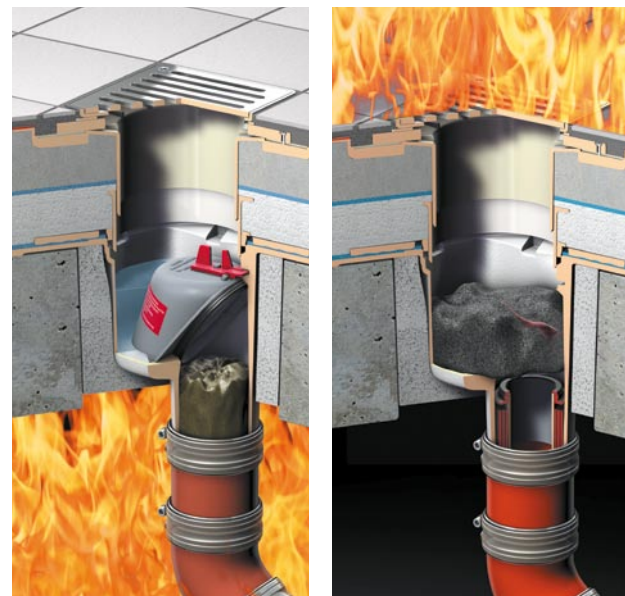
**Roof and park deck drainage –  
ACO Jet and ACO Spin**

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 and special parking deck 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 with its products. Fire protection inserts are available for both drainage systems and give modern roofs the necessary security.

**Fire protection floor drains made of cast iron – ACO Wal-Selecta**

“Preventative fire protection of floor drains” is an important issue when constructing airport terminals. ACO already boasts many years of experience with effective fire protection solutions for the services installed within buildings, and has the appropriate solution in the form of the Wal-Selecta product line. Wal-Selecta floor drains with vertical outlet sockets satisfy fire resistance classes R 30 to R 120 when equipped with fire protection odour traps combined with fire protection cartridges. Fire protection is guaranteed for fires starting either above or below the drains. ACO is the only system supplier whose floor drains have been successfully tested pursuant to DIN 4102 with resistance to overlying and underlying fires.

■ ACO floor drains were tested pursuant to DIN 4102 and satisfy the certification criteria for fire resistance classes R 30 to R 120.





**For intact 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 design and drainage be harmoniously combined?*

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

**Intelligent construction and design solution – ACO DRAIN® Multiline**

The Multiline drainage channel boasts intelligent design with the V cross-section for high flow rates. The body of the channel and the details and materials of the frames and gratings combine aesthetic diversity, high functionality, and extreme durability. The system solution has an extremely varied range of covers. The materials of the gratings and frames can be combined independently of the channel bodies, with versions 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**

ACO Lightline and ACO Lightpoint, or the new ACO Eyeleds, create bright accents within architectural features and open spaces – and also act as unmistakable way markings for paths, etc. ACO Lightline boasts variable colour effects to open up numerous applications for planners in designing the colour dimension of outdoor spaces within airport complexes. ACO Lightpoints are particularly beneficial for enhancing the attraction of areas frequented by heavy traffic. Combined with the ACO DRAIN® Multiline drainage channel, and D 400 load class cast iron gratings, the system combines high quality line drainage with attractive design options. ACO Eyeleds are LED points already installed in a high-strength polymer grating.

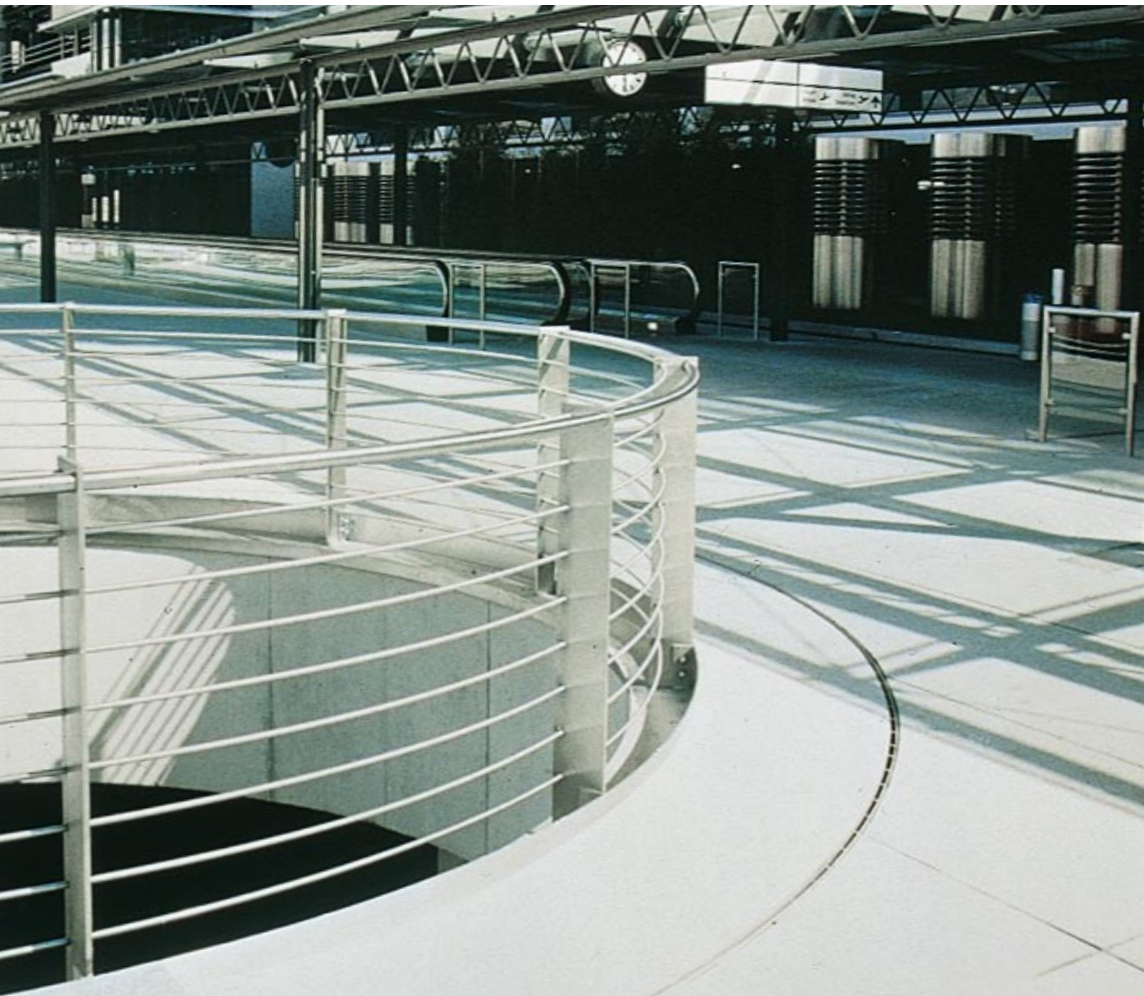
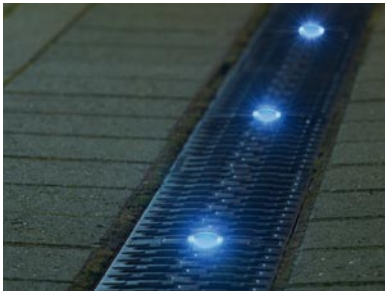




**For tomorrow's infrastructure –  
ACO manhole covers and road drains**

Operational safety, durability and cost efficiency are the main criteria defined for airport infrastructure. 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 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 was expanded in 2008 with the 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.



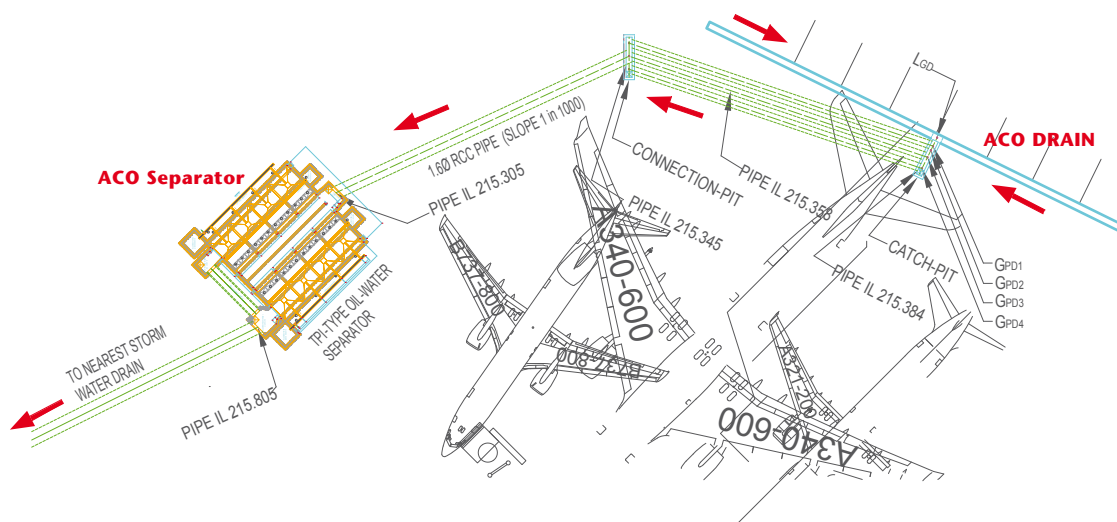


Technical advice and competent service throughout from ordering to installation

### The ACO service package for airport planners

ACO is at your service with its in-depth technical expertise. Our engineers can assist you from the first concepts, all the way through to commissioning and beyond. Our free service for you includes product and installation drawings, as well as dimensioning calculations for drainage channels, light-oil separators and grease separators. We are also available for construction site visits upon request.

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



ACO produces technical solutions for airport drainage – customised of course!

## The ACO Group



ACO drainage systems for the Olympic stadium in Beijing

A strong brand worldwide. ACO products and system solutions are available globally for the professional protection, design and drainage of traffic areas, open spaces and buildings. The 3,800 members of the international ACO family, working in 40 countries with 31 production sites, generated sales of Euro 610 million – with a clear upward trend. The ACO Group today is already optimally positioned as the innovation and quality leader in the growth markets of the 21st century.

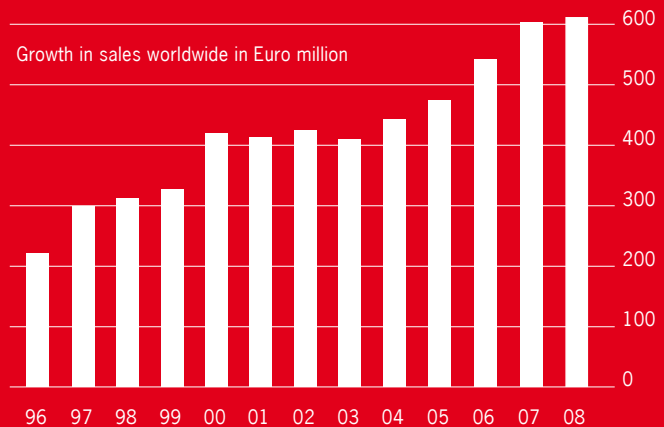
ACO also boasts special solutions for stadiums, gardening and landscaping, customised stainless steel engineering, water treatment and foundry technology.

ACO's high quality is underpinned by the Group's global expertise, intensive research and development, and the many years of competence in processing its most important materials:

- polymer concrete
- stainless steel
- cast iron
- plastic
- reinforced concrete



ACO surface drainage at Potsdamer Platz, Berlin



Events and training courses in the ACO Academy in Rendsburg/Büdelisdorf

### The ACO Group at a glance

- 3,500 employees in 40 countries (Europe, America, Asia, Australia)
- 31 production sites in 12 countries
- Sales 2008: Euro 610 million

**ACO Severin Ahlmann  
GmbH & Co. KG**

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**The ACO Group. A strong family you can build on.**