

Manhole tops:

ACO CityTop

ACO ClassicTop

ACO MultiTop



*Security and durability for the infrastructure of tomorrow*

**The new ACO manhole top matrix**

**Class D 400 according to DIN EN 124**



The new ACO manhole top program with ACO CityTop, ClassicTop and MultiTop



### **ACO and Passavant – two brands forming a strong competence**

Since year 2000 the former Passavant facility Michelbacher Hütte in Aarbergen and its business activities in street casting, drainage and separator technologies are now part of ACO: two strong brands have been merged to ideally complement product ranges and manufacturing locations. Since 1997 the traditional brand AWK has been integrated within the ACO Group.

Out of fine tradition of the two brands the today's highly-developed ACO Guss foundries in Aarbergen and Kaiserslautern exist. Due to continuous investments of the ACO Group the manufacturing facilities have been developed to highest competitiveness for the international market.

The Michelbacher Hütte at ACO Aarbergen



#### **Over 350 years of foundry tradition**

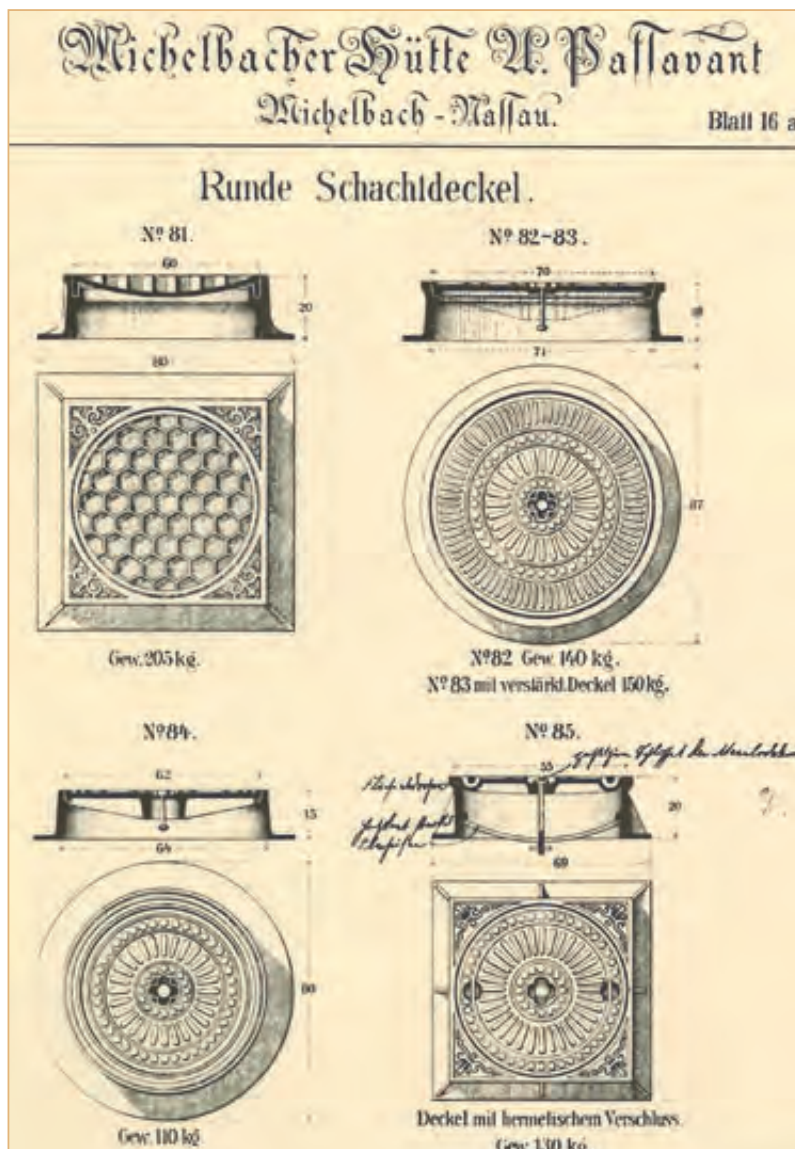
At the Aarbergen location the history of the foundry can be traced back to the founding year in 1652. The production of castings for drainage technology and street casting began at the "Michelbacher Hütte" in the late 19th century after the acquisition by Adolph Passavant.



Modern foundry technology with a fine tradition



Fully automated concrete production



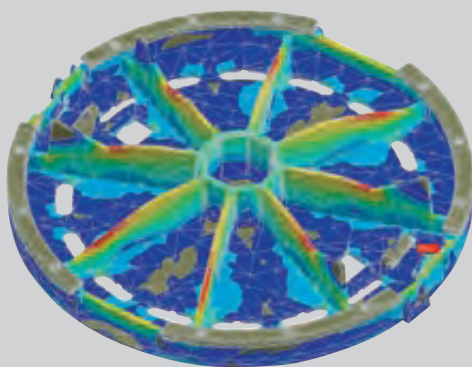
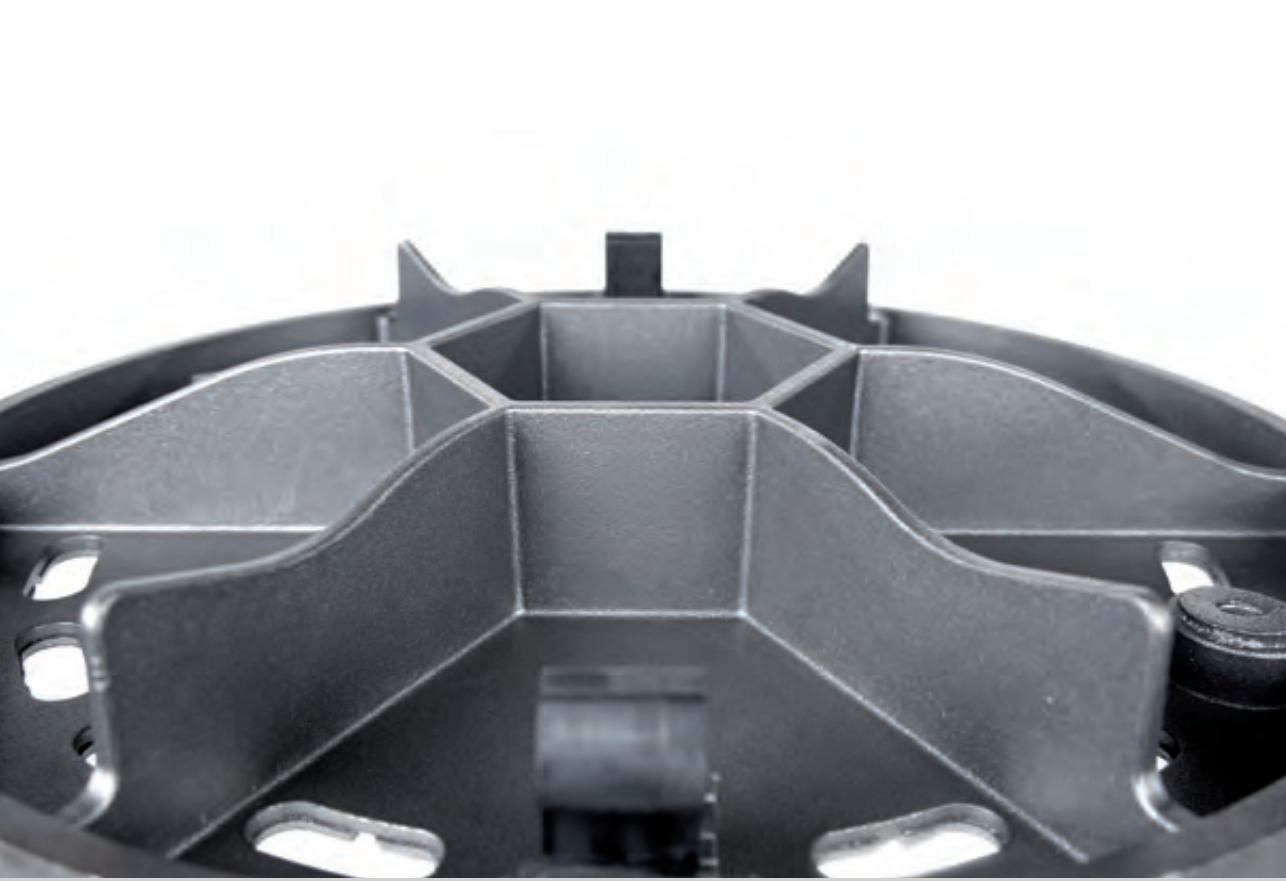
Samuel Adolf Passavant  
(1841 – 1916)  
acquired the Michelbacher  
Hütte in 1884



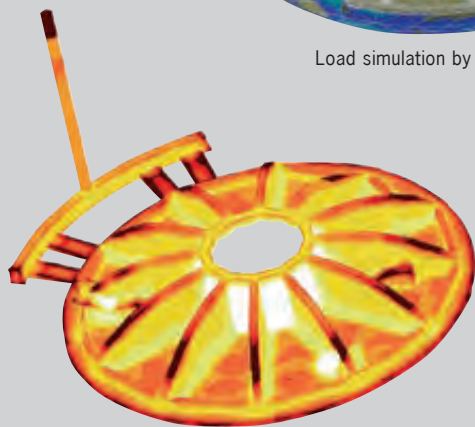
Sir William Lindley  
operated around 1880  
with first canalisation  
projects in Germany

### The century catalogue

In 1890 the first catalogue was created in the Michelbacher Hütte with products for the drainage of buildings and plots of land. This catalogue quickly developed to the standard reference for designers, engineers and architects. It is still considered in its valid version – as today pursued by ACO – as the “bible” of the drainage and separator technology.



Load simulation by finite element analysis



Metal casting simulation

### Competence

ACO successfully tackles the challenges and increasing demands of customers seeking extra sophistication: special product properties, uncompromising quality, speed, and impressive levels of economy. The whole business from development to product prototypes and batch production is managed by project teams handling each phase in co-operation with the customer. The production process itself is backed up by continuous quality management. An integrated quality system underpinned by state-of-the-art testing equipment and optical analytical techniques ensures compliance with all the relevant standards.





## The ACO Group

ACO stands world-wide for top performance, experience and innovative power in drainage construction and civil engineering as well as building services. This key competence has made ACO the world market leader, and is rounded off by special solutions for stadiums, gardening and landscaping, customised stainless steel engineering, process engineering 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 and reinforced concrete.

The ACO Group understands itself as a global player with strong roots in the German market. However, regardless of national differences, we put the ACO brand with its good image, quality claims and core competency at the heart of our marketing activities. An international culture is the hallmark of the ACO Group which fosters a creative balance between the family-based roots and its cosmopolitan approach.

### ACO at a glance

- 1946 foundation of the company
- 3.500 staff in more than 40 countries (Europe, America, Asia, Australia, Arabia)
- 31 production sites in 13 countries
- Turnover 2009: Euro 513 million



ACO drainage systems for the Olympic stadium London 2012

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### ACO Guss –

#### the foundry group within the ACO Group

80,000 tons of net production per year from two production centres in Kaiserslautern and Aarbergen makes ACO one of the leading foundries in Europe. This impressive scale guarantees reliability and professionalism. Our highest priority though is to maintain our reputation built on quality, speed, flexibility, development competence and working with our customers as a professional partner.

In our foundries we produce high performance street casting and drainage systems of the ACO ranges and customised casting solutions with mechanised castings and manual castings backed by state-of-the-art technology, and a proud tradition of craftsmanship stretching back to 1652.

Modern medium frequency induction furnaces at ACO Kaiserslautern



## ACO is certified –

### DIN EN 124 standard conformity

ACO is certified in accordance with DIN EN ISO 9001:2000 and has manufacturer related product qualifications. In addition, in-house monitoring ensures compliance with the regulations for compliance with DIN EN 124 covering street casting and drainage technology products.

Product standards are the common basics for all related partners:

- producer
- independent certification body
- designer/architect (specifier)
- user

EN 124:1994 is the European standard for “gully tops and manhole tops for vehicular and pedestrian areas”. This standard applies to gully tops and manhole tops with a clear opening up to and including 1000 mm.

For gully tops and manhole tops this standard establishes the following:

- definitions
- classes
- materials
- design requirements
- testing requirements
- evaluation of conformity
- marking
- quality control

In many European countries additional requirements for manhole tops and gully tops exist and in Germany they are covered by DIN 1229. Therefore referring to the standard DIN EN 124 includes all requirements of both standards EN 124 and DIN 1229.

To achieve standard conformity with DIN EN 124 all product characteristics and design requirements have to be fulfilled by the producer and be approved and certified by a recognized independent certification body.

An initial type test alone does not ensure that the quality level of a product is continuously maintained. It is the producers' duty to undertake a continuous quality control and that regularly it is verified and tested by a recognized independent certification body.

Designer, architect and user shall verify the standard conformity of products as well as the reliability of producers and their quality control. Specifier and user are responsible for specifying products with full standard conformity to guarantee reliability, traffic and operating safety, security and durability.



**Products conforming to EN 124 shall be marked as follows:**

- 1** number of the standard, i.e. EN 124
- 2** appropriate class (e.g. D 400)
- 3** name and/or identification mark of the manufacturer and of the factory of manufacture which may be in code
- 4** the mark of a certification body

**and may be marked additional with:**

- 5** additional markings relating to the intended application of the user
- 6** product identification (name and/or catalogue number)

All markings shall be clear and durable, where possible, they shall be visible after installation of manhole tops and gully tops.

## Material properties of cast iron

Cast iron has been used successfully in the manufacture of construction products for centuries and is accepted as a reliable choice of material and highly corrosion resistant. Two families of cast iron materials have proved themselves for durable street casting products:

- grey cast iron
- ductile iron

ACO is in position to flexibly manufacture and process both materials in an economic manner. 3D design programmes, computer-based foundry processes and load simulations all contribute to state-of-the-art product development. ACO products are therefore not material-dependent, and can deliver the optimum solution for each application.

| Cast iron with graphite flakes<br>(Grey cast iron)                             | Cast iron with spheroidal graphite<br>(Ductile iron)                           |
|--|--|
| EN-GJL according to EN 1561  | EN-GJS according to EN 1563  |
| High corrosion-resistance to effluents, de-icers, and environmental influences | High corrosion-resistance to effluents, de-icers, and environmental influences |
| High stress resistance 600 to 1080 N/mm <sup>2</sup>                           | High stress resistance 700 to 1150 N/mm <sup>2</sup>                           |
| Optimum damping properties   | Moderate damping properties  |
| Medium tensile strength 100 to 350 N/mm <sup>2</sup>                           | High tensile strength 350 to 900 N/mm <sup>2</sup>                             |
| Limited ductility, low elastic deformation                                     | Excellent ductility, large elastic deformation                                 |
| Preferred material for frames due to optimum damping properties                | Preferred material for covers due to high tensile strength                     |

### Coating and environmental awareness

Manhole tops manufactured from cast iron can be supplied uncoated or coated. Coatings are for aesthetic purposes only and are not regarded as corrosion protection. Cast iron by itself offers a high corrosion resistance as cast iron alloys create a natural coating (patina) due to oxidation. In contrast to steel, cast iron does not corrode continuously into the material structure. If required, ACO provides coated products with an environmental friendly water based coating with less than 5 % dissolvent content. For the reason of health and environment protection no bitumen coatings or PAH (Polycyclic Aromatic Hydrocarbons) containing materials are used.

### BEGU

BEGU means the combination of concrete and cast iron within covers or frames. The concrete used by ACO meets:

- all material requirements
- corresponds to compressive strength class C 35/45
- is conforming to the highest classification of exposure conditions as XC4, XD3, XS3, XF3, XF4 with freeze-thaw resistance with de-icing salt and XA3
- according to EN 206-1 and DIN 1045-2





Durability and reliability



Class A 15



Class B 125



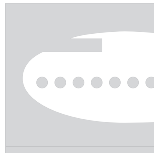
Class C 250



Class D 400



Class E 600



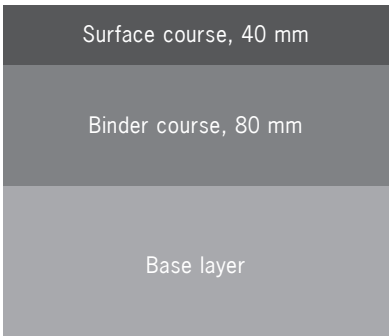
Class F 900

Load class D 400



The appropriate load class of manhole tops and gully tops to be used depends upon the place of installation. Manhole tops and gully tops of Group 4 – class D 400 – are at least to be used for carriageways of roads including pedestrian streets, hard shoulders of roads and parking areas for all kinds of road vehicles. The selection of the appropriate class is the responsibility of the designer.

All ACO manhole tops comply to load class D 400.



Standard European road construction



Damaged road surface due to low frame height

Standard frame height of 100 mm upwards

Manhole tops of class D 400 shall have a minimum frame height of 100 mm. The frame height can be reduced where the frame is provided with anchoring devices within the supporting structure. But savings regarding the frame height cause expensive remedial actions concerning the road surface as a reduced frame height does not give a sufficient bonding to the asphalt courses, consequently cracks in the road surface around the manhole cover will form. Traffic load and weather conditions will accelerate cracking failures. To avoid cracks in the road surface, the height shall be at least 120 mm, placed at the level of the base layer and providing optimum bonding to the asphalt courses.

ACO frames are available with a frame height of 100 mm upwards. Formation of cracks in the road surface is nearly avoided by using at least the ACO standard frame height of 125 mm. The best solution for durability and reliability of shaft and road constructions is the flush-floating ACO Bituplan frame.



## Frame bearing area with high load capacity



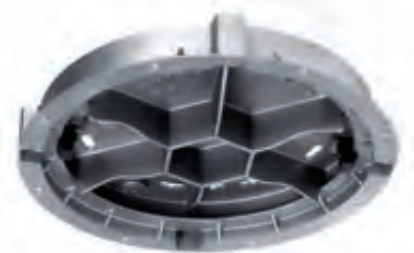
ACO Fix frame



Competitor frame

The bearing area is the surface of the underside of a frame which rests upon the supporting structure. According to EN 124 the bearing pressure shall be less than  $7,5 \text{ N/mm}^2$ . The bearing pressure is the ratio of the test load to the bearing area. Even though the calculated bearing pressure of a frame fulfils the standard requirements, the maximum values of certain frame designs of competitors largely exceed the threshold value of  $7,5 \text{ N/mm}^2$ . In practice, this peak load damages the supporting structure of the frame, e.g. mortar bedding, shaft top; and the manhole top loses stability. The consequences are that not only the frame but also the shaft top have to be refurbished or replaced.

ACO frames of manhole tops are therefore designed in such a way to protect shaft and road construction. For all ACO frame types, **Fix, Lift and Bituplan**, applies that not only the calculated bearing area, but especially the load peaks of the bearing pressure are much lower than the minimum requirement of  $7,5 \text{ N/mm}^2$ . That means less stress for the supporting structure and a high stability of the manhole top.



Underside of an ACO Fix frame with cover

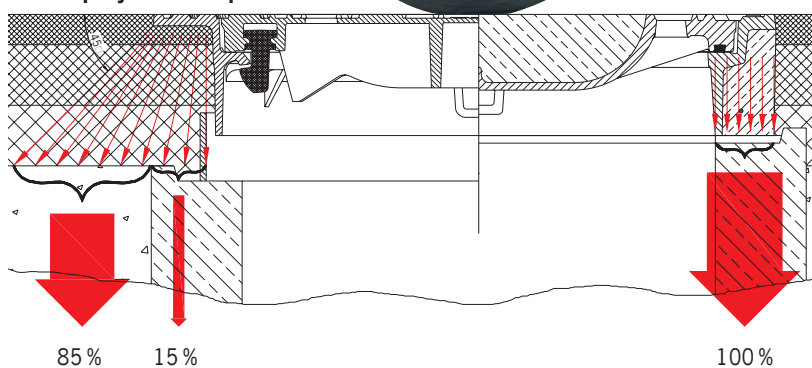
### ACO Bituplan frame

Highest load transfer to protect mortar bedding and shaft top

New:

MultiTop System Bituplan

Manhole top  
DIN 19584



High frame height  
of all ACO frames



## High security and long life



### Traffic safe locking device

ACO manhole tops provide securing features to improve highest traffic safety in accordance to DIN EN 124. ACO **CityTop** and **MultiTop** covers are secured within the frame with locking devices to avoid ejection and/or inappropriate movements. The screwless and non-integrally cast locking devices are engineered and tested to withstand highest vertical ejection forces. Contrary to screws or cast spring bars; ACO securing features assure durable and reliable operation.

#### Advantages

- screwless and non-integrally cast
- no direct contact with the frame therefore no wear, no rattling
- dirt resistant, temperature resistant, vandalism proof
- manufactured from high-strength plastic avoiding material fatigue and cracking
- no cover ejection under traffic



### Highest mass per unit area

ACO **ClassicTop** covers with or without BEGU are secured by highest mass per unit area to improve highest traffic safety. In Europe a sufficient mass per unit area for class D 400 is defined with appropriate minimum values:

- Netherlands, Belgium – 200 kg/m<sup>2</sup>
- Austria – 275 kg/m<sup>2</sup>
- Germany – 300 kg/m<sup>2</sup>

The sufficient high cover weight secures the cover within the frame, but to opening it, only a fractional amount of the cover weight has to be applied to remove it out of the frame. Traffic safety and easy handling are provided. ACO covers meet the requirements of the highest European mass per unit area of 300 kg/m<sup>2</sup>, regulated by DIN 1229.

#### Advantages

- Highest mass per unit area of 300 kg/m<sup>2</sup>
- e.g. cover weight of 85 kg for a clear opening of 600 mm (corresponds to a counterforce greater than 832 N to a vertical ejection force)
- no damage risk of additional securing features
- vandalism proof



### Anti-theft device

In addition to the standard requirements an easy but safe protection with two anti-theft devices can be installed to prevent theft of ACO **CityTop** covers. Initially installed or optionally available as a retrofit kit – simple to install at any time on the cover.

### Cushioning insert in the frame

Seatings in the frames of manhole tops are manufactured in such a way as to ensure stability and quietness in use. As wear can not be avoided, the reduction of wear is therefore a significant opportunity to increase the service life of manhole tops. For that reason a cushioning insert is placed in the frame and not in the cover of all ACO manhole tops. Any wear encountered only affects the cushioning insert, which is easier and more economic to replace than the frame.

#### Advantages

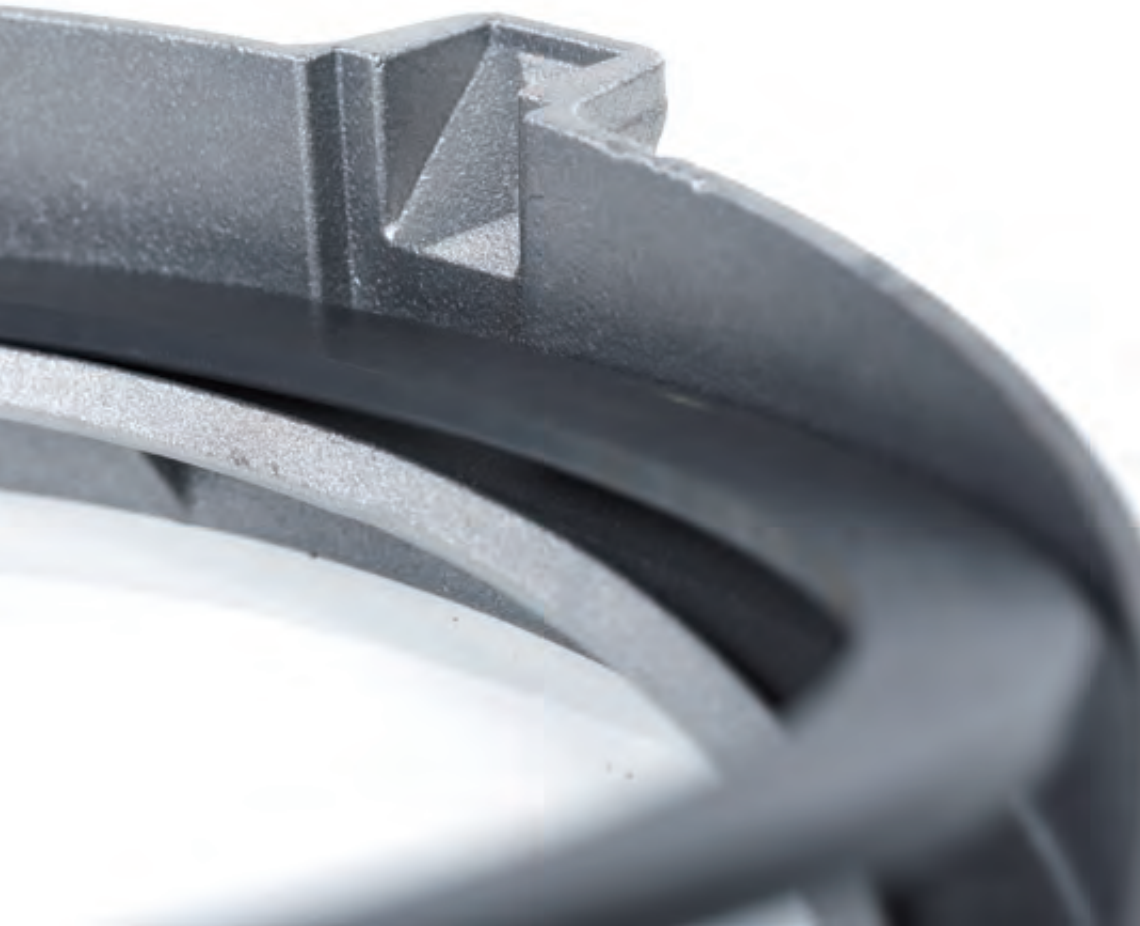
- longer lifetime for manhole tops
- less noise, no rattling of the cover
- wear restricted to the cushioning insert or the cover but not the frame
- if required, easy replacement of cushioning insert with low costs
- extra thick and large PEWEPREN cushioning insert with harder shore for higher resistance and improved stability



On the left, a section through a new frame  
On the right, a section through the identical type of frame after years in use

#### Consequences of wear effect

- instability of the cover
- cover rattles and makes noise
- equipped with the wrong securing method, cover can be ejected
- damages of mortar bedding and/or shaft body due to increased impacts
- frame replacement necessary
- high repair costs
- longer time of obstruction of traffic during frame replacement





## User-friendly and safe in operation

### Easy handling of the cover

Easy handling of **CityTop** and **MultiTop** with customary lifting aid cause of light cover weight and screwless locking device.



Insert the operating key at the unlocking openings at the frame and unlock the cover with a lever movement towards the outside



Then, pull out the cover with the operating key at the lifting openings



To lock the cover only apply a vertical kick or impact on the section of the cover protruding from the frame

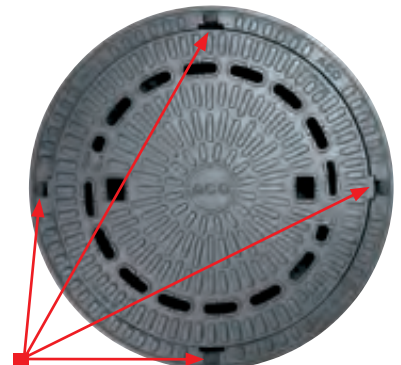
### Maintenance free locking device



**CityTop** and **MultiTop** secured by maintenance free locking device manufactured from highly wear-resistant plastic



The locking device integrated in the cover is protected by special ribs



Unlocking openings to insert the operating key



## Integrated entry-facility device

A manhole is one of the most common types of confined spaces that utility construction workers enter. Providing good access to a manhole considerably reduces the risks on entry.

ACO **MultiTop** manhole covers combined with Lift or Bituplan frames are equipped with an integrated entry-facility device, in which a mobile entry-facility tool is firmly fixed. The worker has a reliable support to hold on to enter and exit a manhole.

Without compromising the ease of opening and closure of the MultiTop manhole cover, the optional use of the entry-facility tool offers to the operator, where required, an adequate security device.

This safety equipment provides safe use of manhole tops and good access to their chambers. For that reason the entry device is considered to minimise accidents. The MultiTop Lift and Multi-Top Bituplan frames with entry-facility fulfil the requirements of accident prevention regulations and correspond to safety guidelines of professional organisations.

### Assembly



Plug-in the entry-facility tool in the appropriate adapter in the frame



The conical guiding profile ensures secure hold



The locking spring interlocks to secure the entry-facility tool

### Dismantling



To release, press with the foot against the locking spring



Once released, pull the tool upwards out of the adapter in the frame



## ACO Manhole top matrix

All ACO CityTop, ClassicTop and Multi-Top manhole covers providing individual product performance and characteristics are flexibly combinable with all Fix, Lift and Bituplan frame types profiting of their individual product benefits and advantages. The result is a manhole top matrix offering an unique interchangeability to provide the best technical and economical solution by simply combining individual product characteristics and advantages related to the appropriate areas of application.

### Frames

#### Fix



#### Lift



#### Bituplan



#### Fix

A manhole top frame with a flange acting as the bearing area of the frame to be placed in mortar bedding or concrete plates for fixed installations.

#### Lift

A manhole top frame manufactured from cast iron or cast iron with concrete (BEGU) with a plane external surface. Through this, Lift frames are liftable for height adjustment and replacing the manhole top flush to the road structure.

#### Bituplan

A manhole top frame system for flush-floating installation in bituminous road structure. The Bituplan frame is disconnected from the manhole shaft and therefore transfers up to 85% of the forces away from the shaft body.

### Cover

#### CityTop



CityTop Fix



CityTop Lift



CityTop Bituplan



## Cover

### ClassicTop



ClassicTop Fix



ClassicTop Lift



ClassicTop Bituplan

### CityTop

A manhole top cover with a reduced cover weight, secured by a screwless and non-integrally cast securing feature and without hinge providing best preconditions for traffic safety and maintenance. Optionally equipped with an anti-theft protection.

### ClassicTop

A manhole top cover manufactured from cast iron and concrete (BEGU), secured by the highest mass per unit area of 300 kg/m<sup>2</sup> according to DIN EN 124 and DIN 1229, without hinge providing strong preconditions for traffic safety and stability.

## Cover

### MultiTop



MultiTop Fix



MultiTop Lift

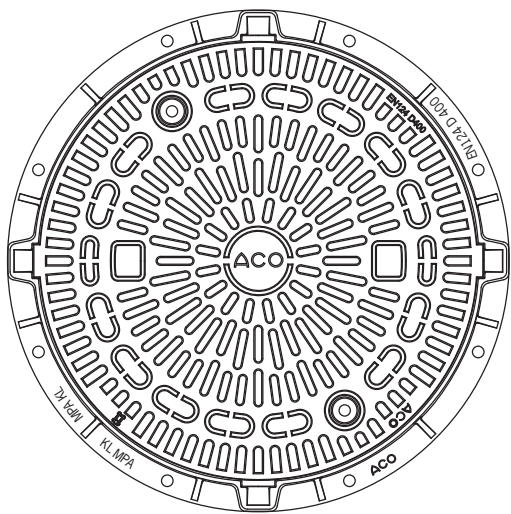
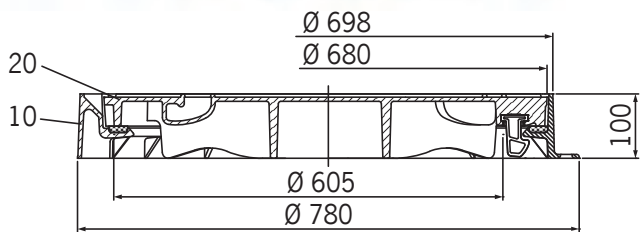


MultiTop Bituplan

### MultiTop

A sophisticated manhole top cover with an optimum cover weight, secured by a high resistant screwless and non-integrally cast securing feature and without hinge providing highest preconditions for traffic safety and maintenance.

**ACO CityTop Fix – D 400, CO 605, Ø 780**  
**according to DIN EN 124**



**Product description**

**ACO CityTop Fix manhole top**  
class D 400 according to DIN EN 124  
**CityTop** manhole cover, round,  
with two maintenance free, screwless,  
non-integrally cast and traffic-safe  
securing features made of high-strength  
plastic  
cover made of spheroidal graphite cast  
iron (GJS)  
weight approx. 39 kg  
without hinge  
**Fix** flanged frame, round  
with PEWEPREN cushioning insert  
clear opening 605 mm, height 100 mm  
external diameter Ø 780 mm  
bearing pressure 3,6 N/mm<sup>2</sup>  
with or without vent holes  
ventilation cross section 215 cm<sup>2</sup>  
total weight approx. 64 kg

**Product information**

**Variations**

- with/without ventilation –  
with/without dirt bucket
- frame height 150 mm
- black hydro-based coating
- coat of arms, logo, inscription
- anti-theft protection

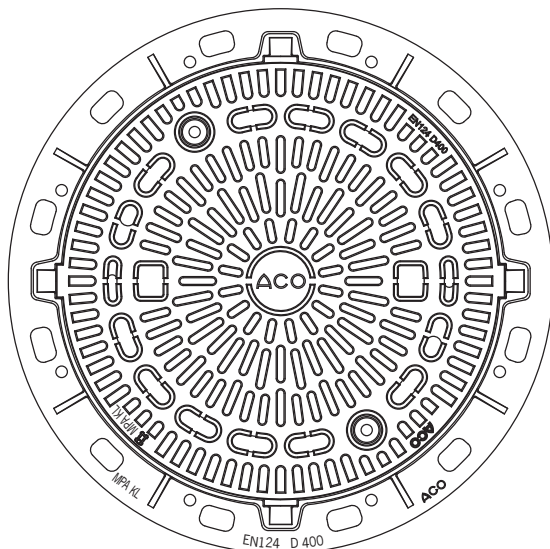
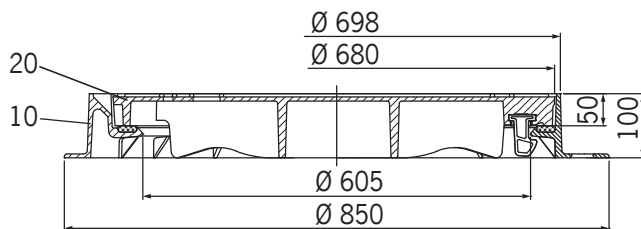
**Accessory**

- anti-theft protection retrofit kit  
**Art. no. 210248**
- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 210147**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Black<br>coated | Anti-theft<br>protection | Art. no.      |
|-------------------|-----------------|---------------|-----------------|--------------------------|---------------|
| 64                | 16              | x             | –               | –                        | <b>210301</b> |
| 66                | 16              | –             | –               | –                        | <b>210302</b> |
| 64                | 16              | x             | x               | –                        | <b>604035</b> |
| 66                | 16              | –             | x               | –                        | <b>604036</b> |
| 65                | 16              | x             | –               | x                        | <b>604060</b> |
| 68                | 16              | –             | –               | x                        | <b>604061</b> |
| 65                | 16              | x             | x               | x                        | <b>604064</b> |
| 68                | 16              | –             | x               | x                        | <b>604065</b> |

## ACO CityTop Fix – D 400, CO 605, Ø 850

according to DIN EN 124



### Product description

#### ACO CityTop Fix manhole top

class D 400 according to DIN EN 124

**CityTop** manhole cover, round, with two maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic

cover made of spheroidal graphite cast iron (GJS)

weight approx. 39 kg

without hinge

**Fix** flanged frame, round

with PEWEPREN cushioning insert

clear opening 605 mm, height 100 mm

external diameter Ø 850 mm

bearing pressure 2,4 N/mm<sup>2</sup>

with or without vent holes

ventilation cross section 215 cm<sup>2</sup>

total weight approx. 66 kg

### Product information

#### Variations

- with/without ventilation – with/without dirt bucket
- frame height 125 mm
- black hydro-based coating
- coat of arms, logo, inscription
- anti-theft protection

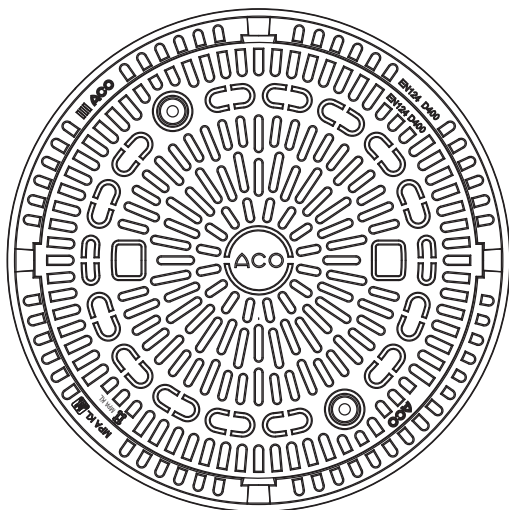
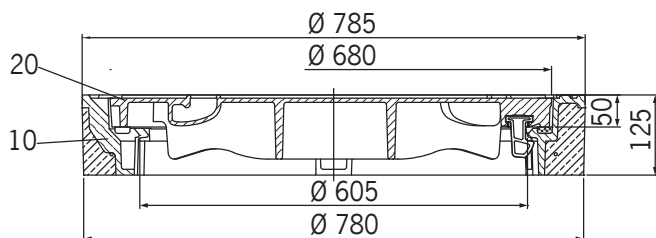
#### Accessory

- anti-theft protection retrofit kit  
**Art. no. 210248**
- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 210147**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Black<br>coated | Anti-theft<br>protection | Art. no.      |
|-------------------|-----------------|---------------|-----------------|--------------------------|---------------|
| 66                | 16              | ×             | –               | –                        | <b>210305</b> |
| 70                | 16              | –             | –               | –                        | <b>210306</b> |
| 66                | 16              | ×             | ×               | –                        | <b>604037</b> |
| 70                | 16              | –             | ×               | –                        | <b>604038</b> |
| 68                | 16              | ×             | –               | ×                        | <b>604062</b> |
| 72                | 16              | –             | –               | ×                        | <b>604063</b> |
| 68                | 16              | ×             | ×               | ×                        | <b>604066</b> |
| 72                | 16              | –             | ×               | ×                        | <b>604067</b> |



**ACO CityTop Lift – D 400, CO 605**  
**according to DIN EN 124**



**Product description**

**ACO CityTop Lift manhole top**  
class D 400 according to DIN EN 124  
**CityTop** manhole cover, round,  
with two maintenance free, screwless,  
non-integrally cast and traffic-safe  
securing features made of high-strength  
plastic  
cover made of spheroidal graphite cast  
iron (GJS)  
weight approx. 39 kg  
without hinge  
**Lift** BEGU frame, round  
liftable for height adjustment  
with PEWEPREN cushioning insert  
clear opening 605 mm, height 125 mm  
external diameter Ø 780 mm  
bearing pressure 2,6 N/mm<sup>2</sup>  
with or without vent holes  
ventilation cross section 215 cm<sup>2</sup>  
total weight approx. 109 kg

**Product information**

**Variations**

- with/without ventilation –  
with/without dirt bucket
- frame height 150 mm
- black hydro-based coating
- coat of arms, logo, inscription

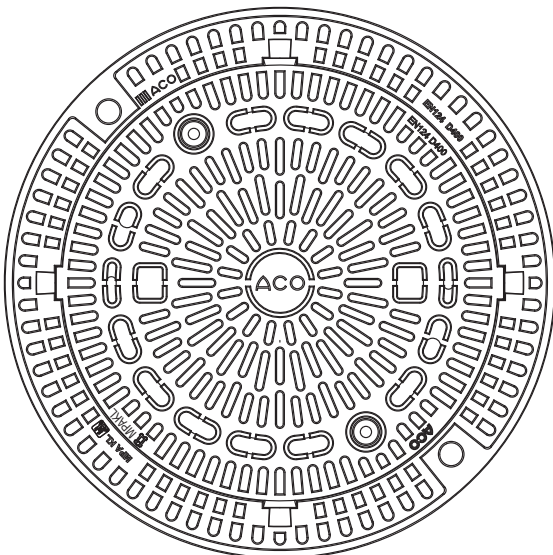
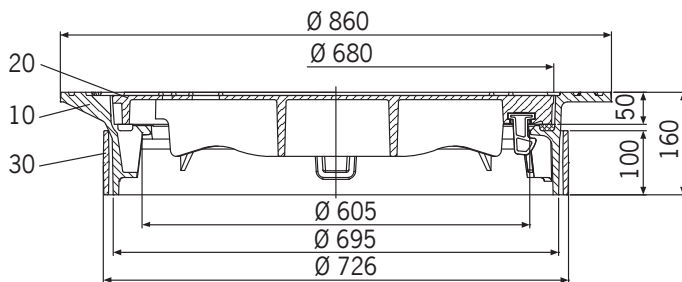
**Accessory**

- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 602320**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Black<br>coated | Art. no.      |
|-------------------|-----------------|---------------|-----------------|---------------|
| 109               | 12              | ×             | –               | <b>604033</b> |
| 119               | 12              | –             | –               | <b>604034</b> |
| 109               | 12              | ×             | ×               | <b>604039</b> |
| 113               | 12              | –             | ×               | <b>604040</b> |

## ACO CityTop Bituplan – D 400, CO 605

according to DIN EN 124



### Product description

**ACO CityTop Bituplan manhole top system**  
class D 400 according to DIN EN 124  
for flush-floating installation in bituminous  
road structure

**CityTop** manhole cover, round,  
with two maintenance free, screwless,  
non-integrally cast and traffic-safe  
securing features made of high-strength  
plastic

cover made of spheroidal graphite cast  
iron (GJS)

weight approx. 39 kg

without hinge

**Bituplan** frame, round  
for flush-floating installation in bituminous  
road structure

with PEWEPREN cushioning insert  
clear opening 605 mm, height 160 mm

**installation height min. 170 mm up  
to max. 230 mm,**

external diameter Ø 860 mm

bearing pressure 2,1 N/mm<sup>2</sup>

**with adapter ring**

with or without vent holes

ventilation cross section 215 cm<sup>2</sup>

total weight approx. 102 kg

### Product information

#### Variations

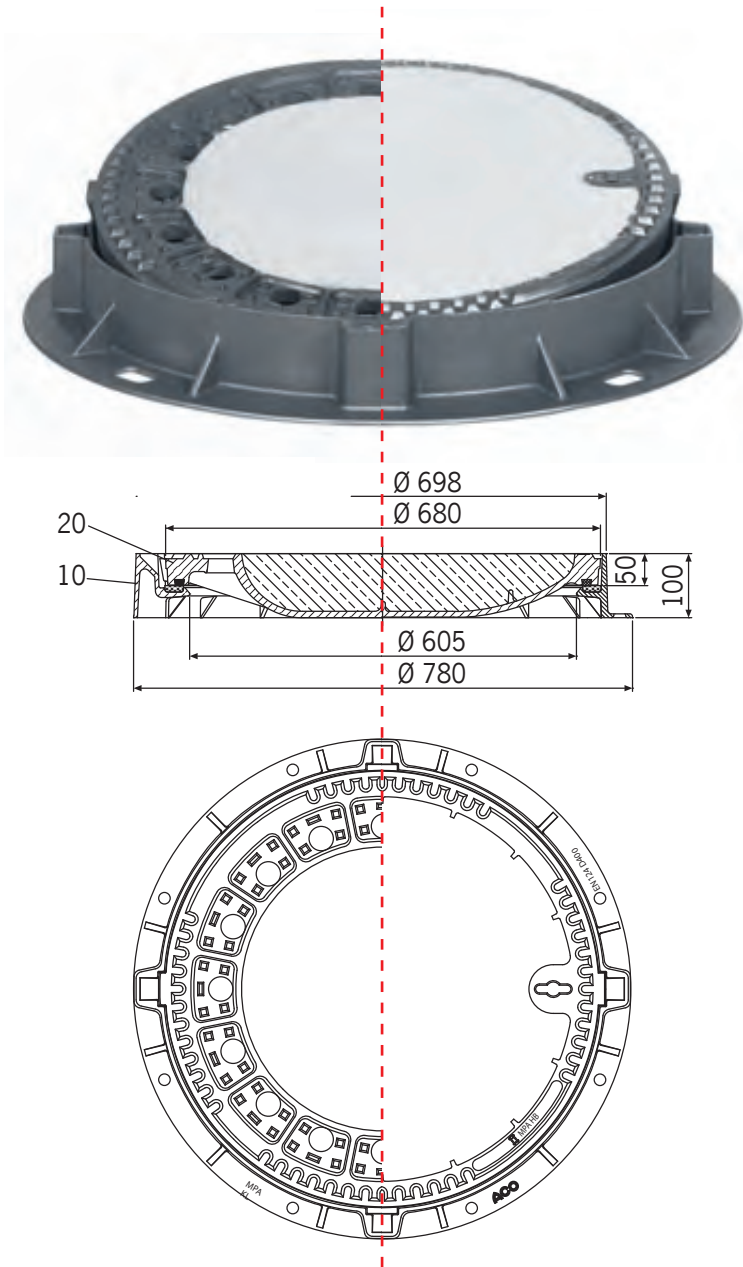
- with/without ventilation –  
with/without dirt bucket
- frame height 140 mm
- black hydro-based coating
- coat of arms, logo, inscription
- anti-theft protection

#### Accessory

- anti-theft protection retrofit kit  
**Art. no. 210248**
- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 602320**
- installation shuttering (reusable)  
**Art. no. 64476**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Black<br>coated | Anti-theft<br>protection | Art. no.      |
|-------------------|-----------------|---------------|-----------------|--------------------------|---------------|
| 102               | 12              | ×             | –               | –                        | <b>210313</b> |
| 105               | 1               | –             | –               | –                        | <b>210314</b> |
| 102               | 12              | ×             | ×               | –                        | <b>604045</b> |
| 105               | 12              | –             | ×               | –                        | <b>604046</b> |
| 103               | 12              | ×             | –               | ×                        | <b>604074</b> |
| 106               | 12              | –             | –               | ×                        | <b>604079</b> |
| 103               | 12              | ×             | ×               | ×                        | <b>604080</b> |
| 106               | 12              | –             | ×               | ×                        | <b>604081</b> |

**ACO ClassicTop Fix – D 400, CO 605, Ø 780**  
**according to DIN EN 124/DIN 1229**



**Product description**

**ACO ClassicTop Fix manhole top**  
class D 400 according to DIN EN 124  
and DIN 1229

**ClassicTop** BEGU manhole cover, round,  
with mass per unit area of 300 kg/m<sup>2</sup>  
cover made of concrete C35/45 XF4  
and cast iron (GJS)  
weight approx. 89 kg  
without hinge

**Fix** flanged frame, round  
with PEWEPREN cushioning insert  
clear opening 605 mm, height 100 mm  
external diameter Ø 780 mm  
bearing pressure 3,6 N/mm<sup>2</sup>  
with or without vent holes  
ventilation cross section 156 cm<sup>2</sup>  
total weight approx. 113 kg

**Product information**

**Variations**

- with/without ventilation –  
with/without dirt bucket
- frame height 150 mm
- coat of arms, logo, inscription

**Accessory**

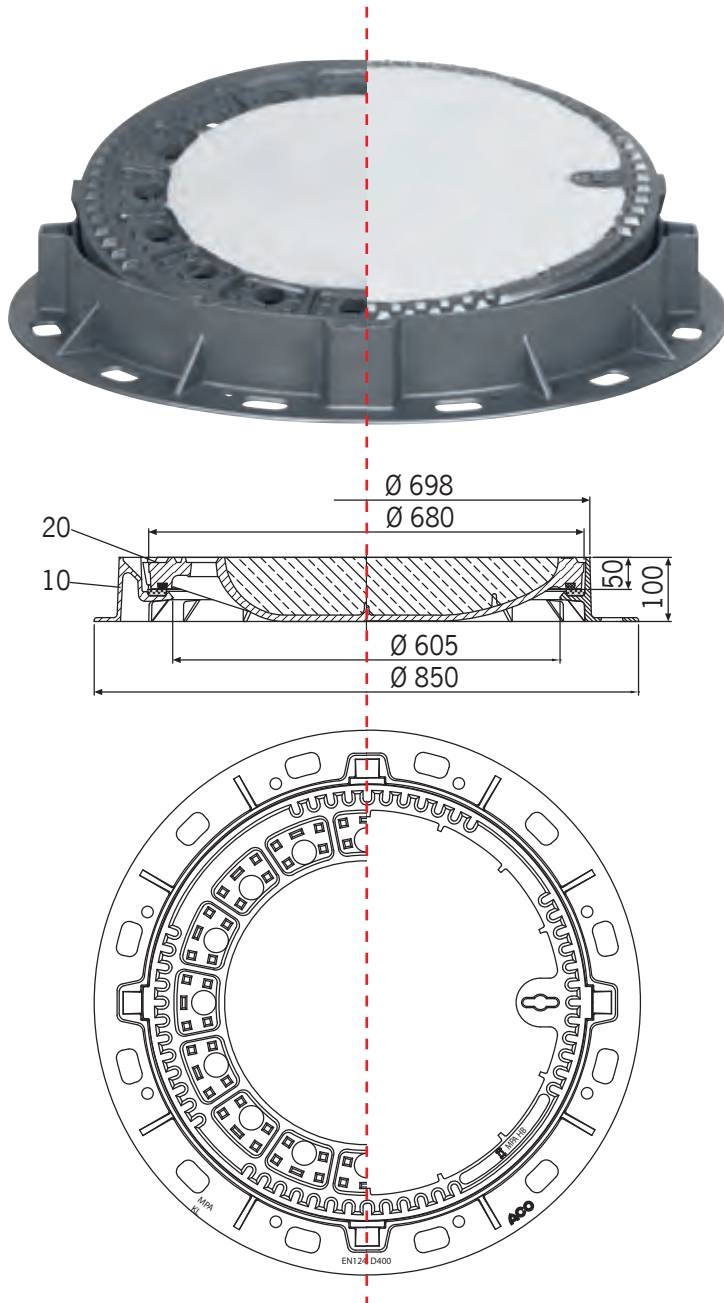
- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 210147**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Art. no.      |
|-------------------|-----------------|---------------|---------------|
| 113               | 12              | ×             | <b>210279</b> |
| 114               | 12              | –             | <b>210280</b> |



## ACO ClassicTop Fix – D 400, CO 605, Ø 850

according to DIN EN 124/DIN 1229



### Product description

**ACO ClassicTop Fix manhole top**  
class D 400 according to DIN EN 124  
and DIN 1229

**ClassicTop** BEGU manhole cover, round,  
with mass per unit area of 300 kg/m<sup>2</sup>  
cover made of concrete C35/45 XF4  
and cast iron (GJS)  
weight approx. 89 kg  
without hinge

**Fix** flanged frame, round  
with PEWEPREN cushioning insert  
clear opening 605 mm, height 100 mm  
external diameter Ø 850 mm  
bearing pressure 2,4 N/mm<sup>2</sup>  
with or without vent holes  
ventilation cross section 156 cm<sup>2</sup>  
total weight approx. 116 kg

### Product information

#### Variations

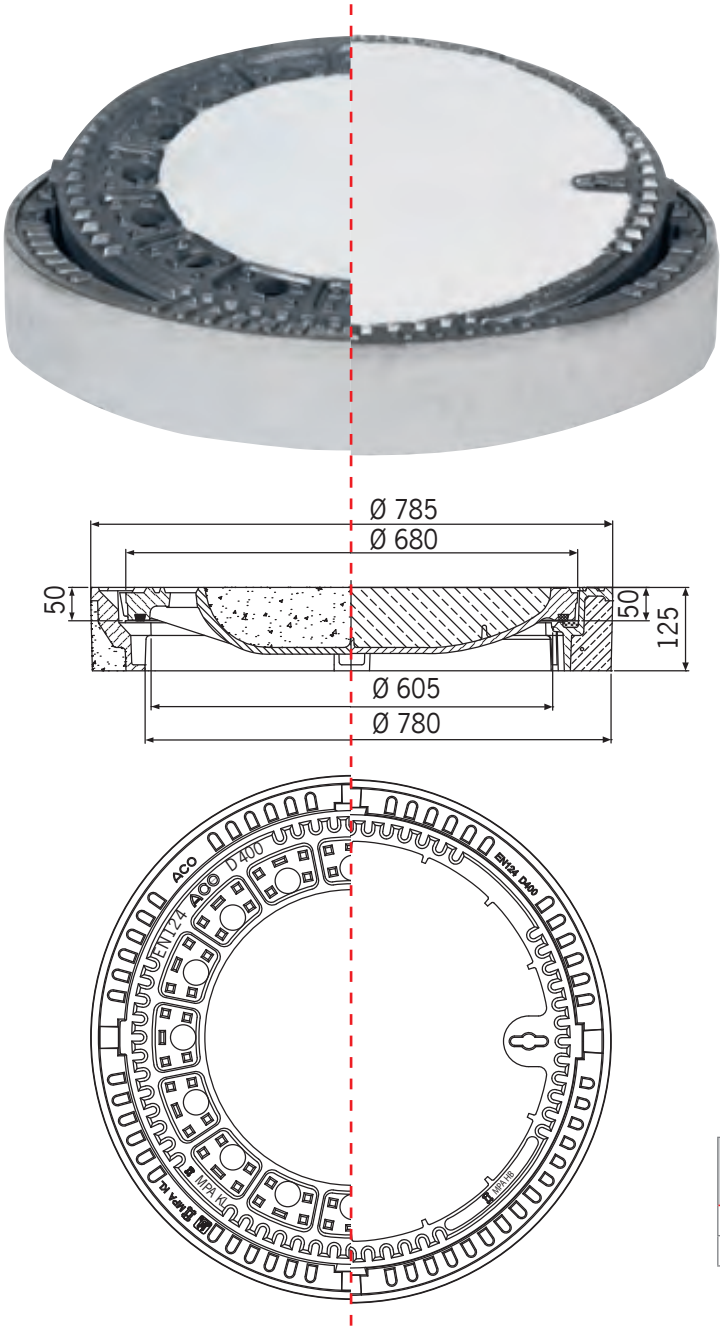
- with/without ventilation –  
with/without dirt bucket
- frame height 125 mm
- coat of arms, logo, inscription

#### Accessory

- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 210147**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Art. no.      |
|-------------------|-----------------|---------------|---------------|
| 116               | 12              | ×             | <b>210283</b> |
| 118               | 12              | –             | <b>210284</b> |

ACO ClassicTop Lift – D 400, CO 605  
according to DIN EN 124/DIN 1229



Product description

**ACO ClassicTop Lift manhole top**  
class D 400 according to DIN EN 124  
and DIN 1229

**ClassicTop** BEGU manhole cover, round,  
with mass per unit area of 300 kg/m<sup>2</sup>  
cover made of concrete C35/45 XF4  
and cast iron (GJS)  
weight approx. 89 kg  
without hinge

**Lift** BEGU frame, round  
liftable for height adjustment  
with PEWEPREN cushioning insert  
clear opening 605 mm, height 125 mm  
external diameter Ø 780 mm  
bearing pressure 2,6 N/mm<sup>2</sup>  
with or without vent holes  
ventilation cross section 156 cm<sup>2</sup>  
total weight approx. 158 kg

Product information

Variations

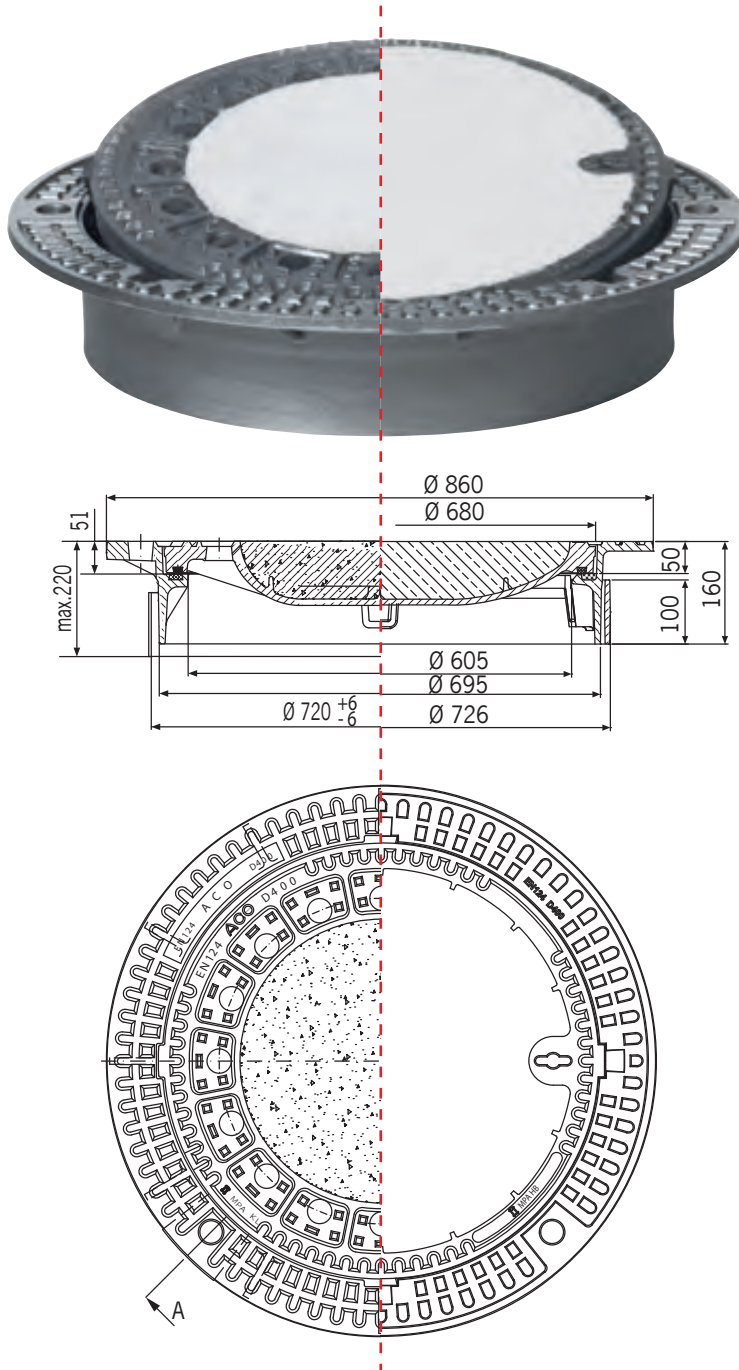
- with/without ventilation –  
with/without dirt bucket
- frame height 150 mm
- coat of arms, logo, inscription

Accessory

- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 602320**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Art. no. |
|-------------------|-----------------|---------------|----------|
| 158               | 10              | ×             | 604637   |
| 165               | 10              | –             | 604636   |

## ACO ClassicTop Bituplan – D 400, CO 605 according to DIN EN 124/DIN 1229



### Product description

**ACO ClassicTop Bituplan manhole top**  
class D 400 according to DIN EN 124  
and DIN 1229

for flush-floating installation in bituminous  
road structure

**ClassicTop** BEGU manhole cover, round,  
with mass per unit area of 300 kg/m<sup>2</sup>  
cover made of concrete C35/45, XF4  
and cast iron (GJS)

weight approx. 89 kg

without hinge

**Bituplan** frame, round

for flush-floating installation in bituminous  
road structure

with PEWEPREN cushioning insert

clear opening 605 mm, height 160 mm

installation height min. 170 mm up to  
max. 230 mm

external diameter Ø 860 mm

bearing pressure 2,1 N/mm<sup>2</sup>

with adapter ring

with or without vent holes

ventilation cross section 215 cm<sup>2</sup>

total weight approx. 161 kg

### Product information

#### Variations

- with/without ventilation –  
with/without dirt bucket
- frame height 140 mm
- coat of arms, logo, inscription

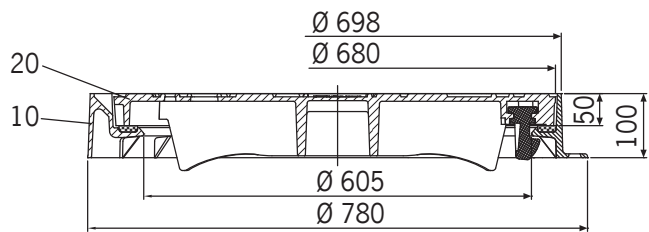
#### Accessory

- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 602320**
- installation shuttering (reusable)  
**Art. no. 64476**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Art. no.     |
|-------------------|-----------------|---------------|--------------|
| 161               | 5               | ×             | <b>66320</b> |
| 169               | 5               | –             | <b>67824</b> |



**ACO MultiTop Fix – D 400, CO 605, Ø 780**  
**according to DIN EN 124/DIN 1229**



**Product description**

**ACO MultiTop Fix manhole top**  
class D 400 according to DIN EN 124  
and DIN 1229

**MultiTop** manhole cover, round,  
with two high resistant, maintenance  
free, screwless, non-integrally cast and  
traffic-safe securing features made of  
high-strength plastic  
cover made of spheroidal graphite cast  
iron (GJS)

weight approx. 44 kg  
without hinge

**Fix** flanged frame, round  
with PEWEPREN cushioning insert  
clear opening 605 mm, height 100 mm  
external diameter Ø 780 mm  
bearing pressure 3,6 N/mm<sup>2</sup>  
with or without vent holes  
ventilation cross section 215 cm<sup>2</sup>  
total weight approx. 67 kg

**Product information**

**Variations**

- with/without ventilation –  
with/without dirt bucket
- frame height 150 mm
- black hydro-based coating
- coat of arms, logo, inscription

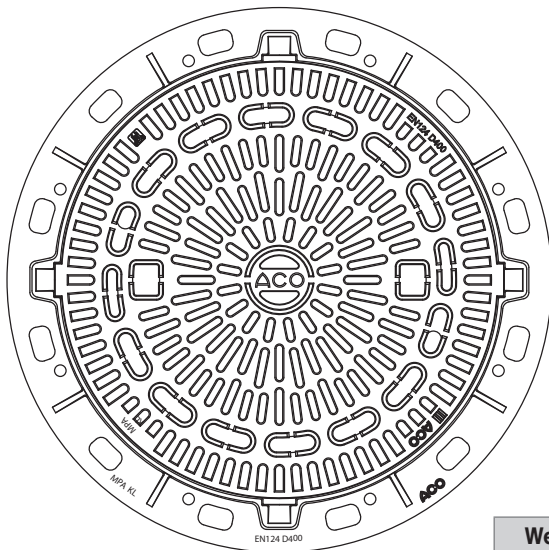
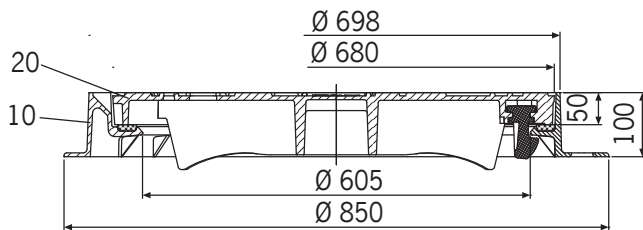
**Accessory**

- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 210147**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Black<br>coated | Art. no.      |
|-------------------|-----------------|---------------|-----------------|---------------|
| 67                | 16              | ×             | –               | <b>604052</b> |
| 71                | 16              | –             | –               | <b>604053</b> |
| 67                | 16              | ×             | ×               | <b>604082</b> |
| 71                | 16              | –             | ×               | <b>604083</b> |

## ACO MultiTop Fix – D 400, CO 605, Ø 850

according to DIN EN 124/DIN 1229



### Product description

**ACO MultiTop Fix manhole top**  
class D 400 according to DIN EN 124  
and DIN 1229

**MultiTop** manhole cover, round,  
with two high resistant, maintenance  
free, screwless, non-integrally cast and  
traffic-safe securing features made of  
high-strength plastic  
cover made of spheroidal graphite cast  
iron (GJS)

weight approx. 44 kg

without hinge

**Fix** flanged frame, round  
with PEWEPREN cushioning insert  
clear opening 605 mm, height 100 mm  
external diameter Ø 850 mm  
bearing pressure 2,4 N/mm<sup>2</sup>  
with or without vent holes  
ventilation cross section 215 cm<sup>2</sup>  
total weight approx. 71 kg

### Product information

#### Variations

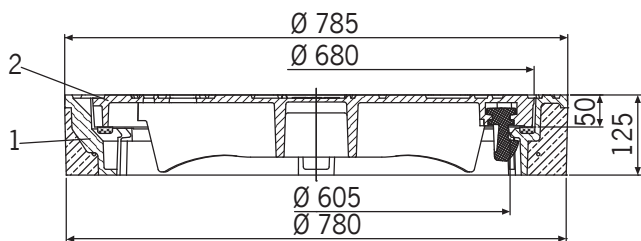
- with/without ventilation –  
with/without dirt bucket
- frame height 150 mm
- black hydro-based coating
- coat of arms, logo, inscription

#### Accessory

- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 210147**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Black<br>coated | Art. no.      |
|-------------------|-----------------|---------------|-----------------|---------------|
| 71                | 16              | ×             | –               | <b>604054</b> |
| 74                | 16              | –             | –               | <b>604055</b> |
| 71                | 16              | ×             | ×               | <b>604085</b> |
| 74                | 16              | –             | ×               | <b>604086</b> |

**ACO MultiTop Lift – D 400, CO 605 with entry-facility**  
**according to DIN EN 124/DIN 1229**



**Product description**

**ACO MultiTop Lift manhole top**  
class D 400 according to DIN EN 124  
and DIN 1229  
**MultiTop** manhole cover, round,  
with two high resistant, maintenance  
free, screwless, non-integrally cast and  
traffic-safe securing features made of  
high-strength plastic  
cover made of spheroidal graphite cast  
iron (GJS)  
weight approx. 44 kg  
without hinge  
**Lift** BEGU frame, round  
liftable for height adjustment  
with entry-facility device  
with PEWEPREN cushioning insert  
clear opening 605 mm, height 125 mm  
external diameter Ø 780 mm  
bearing pressure 2,6 N/mm<sup>2</sup>  
with or without vent holes  
ventilation cross section 215 cm<sup>2</sup>  
total weight approx. 113 kg

**Product information**

- Variations**
- with/without ventilation –  
with/without dirt bucket
  - frame height 150 mm
  - black hydro-based coating
  - coat of arms, logo, inscription

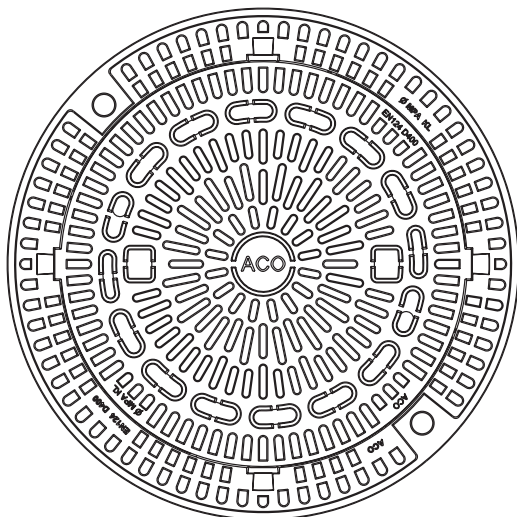
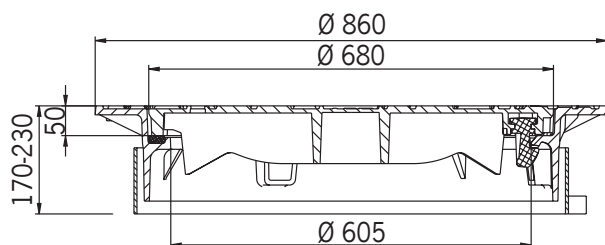
- Accessory**
- opening tools **Art. no. 600643**
  - cushioning inserts **Art. no. 602320**
  - entry-facility tool **Art. no. 11840**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Black<br>coated | Art. no.     |
|-------------------|-----------------|---------------|-----------------|--------------|
| 113               | 10              | ×             | –               | <b>11810</b> |
| 115               | 10              | –             | –               | <b>11811</b> |
| 113               | 10              | ×             | ×               | <b>11815</b> |
| 115               | 10              | –             | ×               | <b>11816</b> |



**ACO MultiTop Bituplan – D 400, CO 605 with entry-facility**

according to DIN EN 124/DIN 1229

**Product description**

**ACO MultiTop Bituplan manhole top system**  
class D 400 according to DIN EN 124  
and DIN 1229

for flush-floating installation in bituminous  
road structure

**MultiTop** manhole cover, round,  
with two high resistant, maintenance free,  
screwless, non-integrally cast and traffic-safe  
securing features made of high-strength  
plastic

cover made of spheroidal graphite cast  
iron (GJS)

weight approx. 44 kg

without hinge

**Bituplan** frame, round  
for flush-floating installation in bituminous  
road structure

with entry-facility device

with PEWEPREN cushioning insert

clear opening 605 mm, height 160 mm

**installation height min. 170 mm up to  
max. 230 mm**

external diameter Ø 860 mm

bearing pressure 2,1 N/mm<sup>2</sup>

**with adapter ring**

with or without vent holes

ventilation cross section 215 cm<sup>2</sup>

total weight approx. 104 kg

**Product information****Variations**

- with/without ventilation –  
with/without dirt bucket
- frame height 140 mm
- black hydro-based coating
- coat of arms, logo, inscription

**Accessory**

- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 602320**
- installation shuttering (reusable)  
**Art. no. 64476**
- entry-facility tool **Art. no. 11840**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Black<br>coated | Art. no.     |
|-------------------|-----------------|---------------|-----------------|--------------|
| 104               | 10              | ×             | –               | <b>11800</b> |
| 106               | 10              | –             | –               | <b>11801</b> |
| 104               | 10              | ×             | ×               | <b>11806</b> |
| 106               | 10              | –             | ×               | <b>11807</b> |



## Special ACO manhole tops

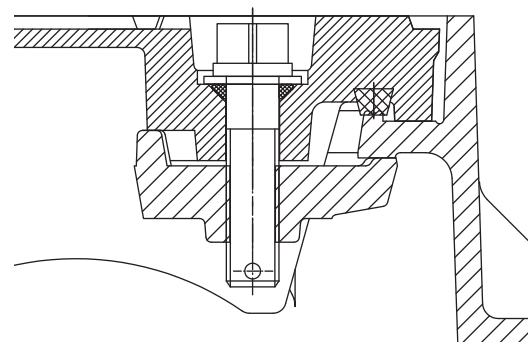
### Backflow save and surface waterproof

In special local circumstances, occasional or accidental events, such as upward water pressure due to surcharge, mean that special manhole tops are required, which are both surface watertight and backflow resistant. For the development of the surface watertight/backflow resistant MultiTop manhole tops the highest priority was to combine the main benefits of the standard product, such as the user-friendly and low maintenance MultiTop technology with these special product requirements.

#### Advantages

- screwless locking device
- no restriction to the clear opening
- one manhole cover for both applications

#### Turnbuckle detail



The manhole cover is locked by a special turnbuckle device. Located beneath the seating area of the frame it presses the seal within the manhole cover downwards. The seal is circumferentially compressed and the manhole top surface watertight. Due to this special locking device the clear area of the opening is not restricted and free access to the shaft is maintained.

## Definitions

### ■ surface watertight

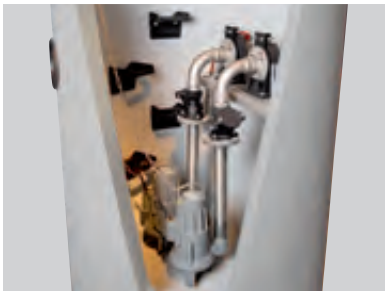
Surface watertight manhole tops prevent free-flowing surface water ingress (rain water) into the manhole.

### ■ backflow resistant

Backflow resistant manhole tops are sealed against water pressure from above and below. The tightness is achieved by seals between frame, cover and locking device. The connection between shaft top and manhole frame must be made very carefully. The manhole frame must be securely anchored to the shaft top to resist applied pressure.



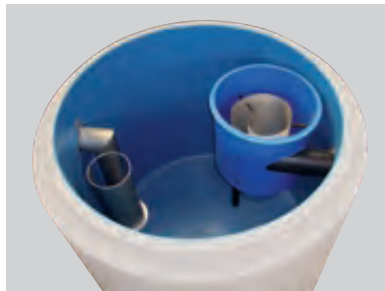
## Applications



Utility shaft

Manhole tops for utility shafts or chambers have to be surface watertight to prevent the ingress of surface water or damp into the adjacent premises.

Surface watertight manhole tops should be designed and installed in such a way that as little water as possible remains on the manhole cover and therefore penetrates into the joint between cover and frame. Seals need to be maintained and must be regularly cleaned, maintained and replaced if necessary.



Separator for light liquids

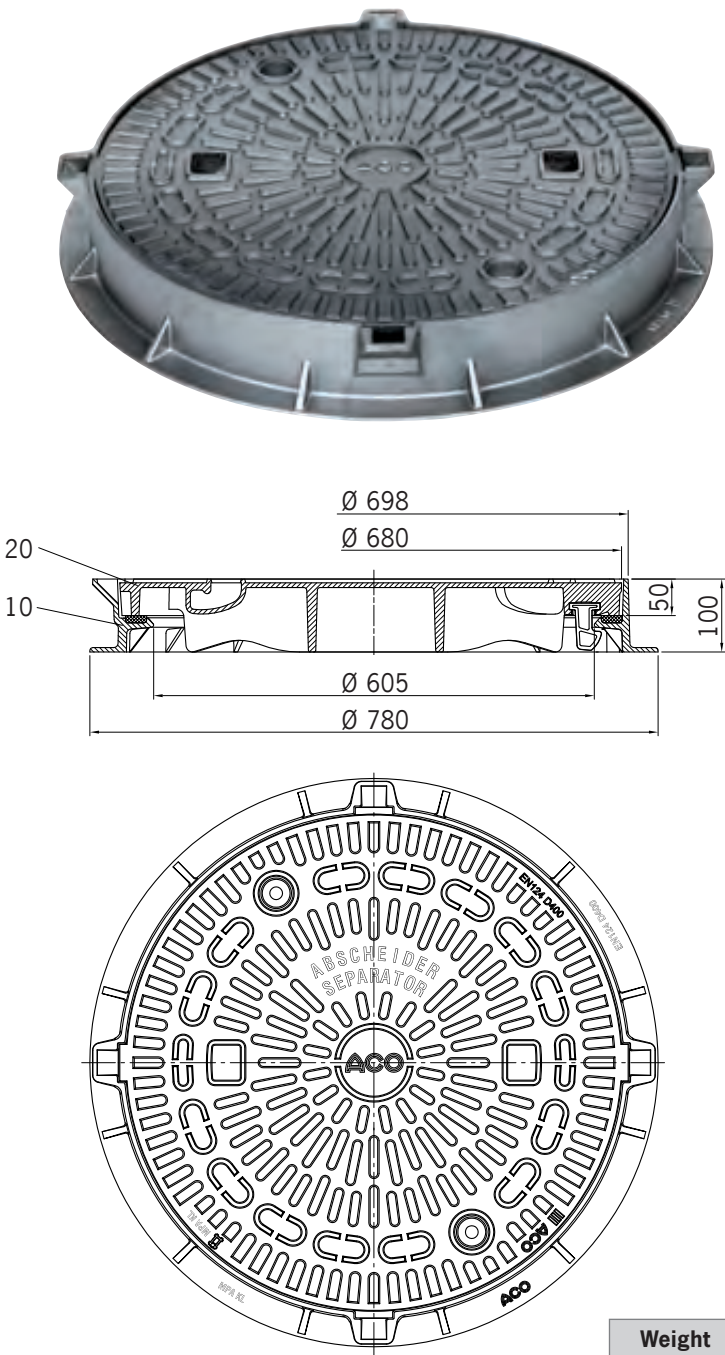
Separator systems for light liquids, e.g. oil and petrol, shall have according to EN 858-1 manhole tops without any vent holes or openings. Further the bearing surface of the frame shall be done in such a way to provide watertight installation of the manhole top on the separator. Seals need to be maintained and must be regularly cleaned, maintained and replaced if necessary.



A backflow resistant manhole top is surface watertight and resists high water pressures. In addition, its frame has anchoring devices to fix to the shaft top. Backflow resistant manhole tops are for example used in areas subject to flooding. Seals need to be maintained and must be regularly cleaned, maintained and replaced if necessary.



**ACO CityTop Fix Separator – D 400, CO 605, Ø 780**  
**according to DIN EN 124 and EN 858-1 Separator**  
**systems for light liquids (e.g. oil and petrol)**



**Product description**

**ACO CityTop Fix Separator manhole top** class D 400 according to DIN EN 124 and EN 858-1 for separator systems for light liquids

**CityTop** manhole cover, round with two maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic with inscription “Abscheider/Separator” without vent holes or any opening cover made of spheroidal graphite cast iron (GJS), weight approx. 39 kg, without hinge

**Fix** flanged frame, round with oil- and fuel-resistant cushioning insert with closed frame bearing surface for watertight installation clear opening 605 mm, height 100 mm external diameter Ø 780 mm total weight approx. 64 kg

**Product information**

**Variations**

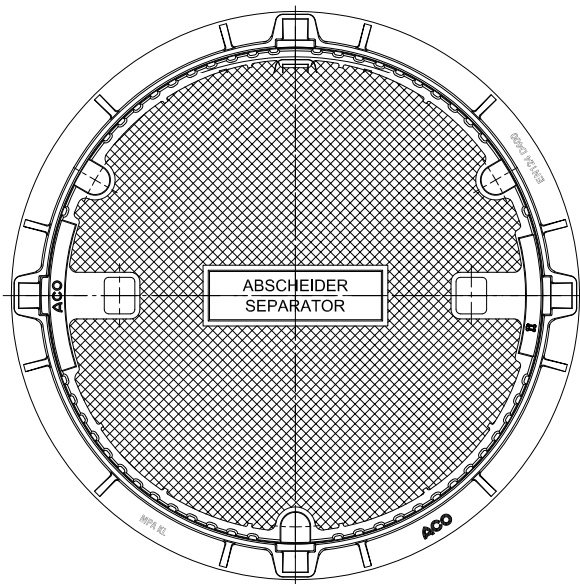
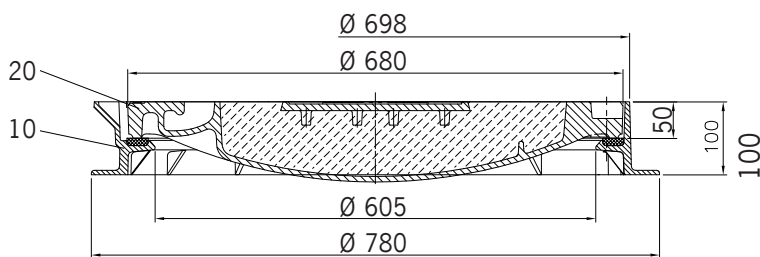
- black hydro-based coating
- anti-theft protection

**Accessory**

- anti-theft protection retrofit kit **Art. no. 210248**
- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 210147**

| Weight [kg/pc] | Package unit | Black coated | Anti-theft | Art. no.      |
|----------------|--------------|--------------|------------|---------------|
| 66             | 16           | –            | –          | <b>210329</b> |
| 66             | 16           | ×            | –          | <b>604049</b> |
| 68             | 16           | –            | ×          | <b>604075</b> |
| 68             | 16           | ×            | ×          | <b>604076</b> |

**ACO ClassicTop Fix Separator – D 400, CO 605, Ø 780**  
**according to DIN EN 124 and EN 858-1 Separator**  
**systems for light liquids (e.g. oil and petrol)**



**Product description**

**ACO ClassicTop Fix Separatoir** manhole top class D 400 according to DIN EN 124 and EN 858-1 for separator systems for light liquids

**ClassicTop** Begu manhole cover, round with mass per unit area of 300 kg/m<sup>2</sup> with inscription "Abscheider/Separator" without vent holes or any opening cover made of concrete C35/45 XF4 and cast iron (GJS), weight approx. 89 kg without hinge

**Fix** flanged frame, round with oil- and fuel-resistant cushioning insert with closed frame bearing surface for water-tight installation clear opening 605 mm, height 100 mm external diameter Ø 780 mm total weight approx. 114 kg

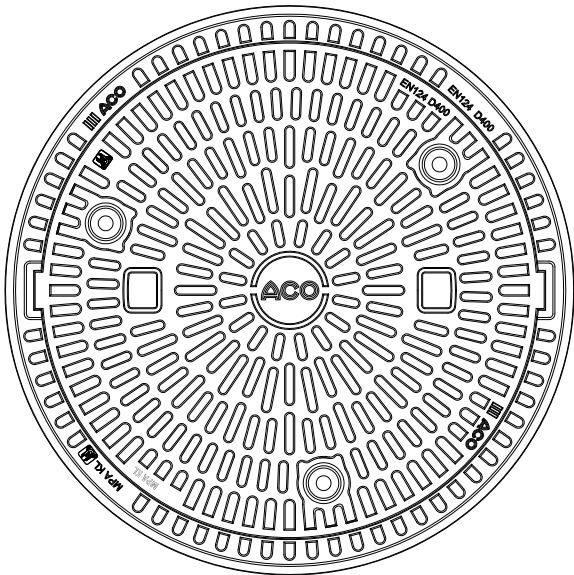
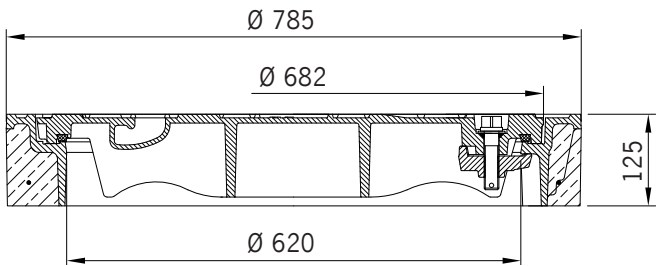
**Product information**

**Accessory**

- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 210147**

| Weight<br>[kg/pc] | Package<br>unit | Art. no. |
|-------------------|-----------------|----------|
| 114               | 16              | 604511   |

**ACO MultiTop surface water proof – D 400, CO 620**  
**according to DIN EN 124/DIN 1229**



**Product description**

**ACO MultiTop surface water proof**  
class D 400 according to DIN EN 124  
and DIN 1229

**MultiTop** manhole cover, round  
with three special turnbuckle locking  
devices  
with oil- and fuel-resistant sealing  
cover made of spheroidal graphite cast  
iron (GJS)  
weight approx. 45 kg  
without hinge

**Lift** BEGU frame, round  
clear opening 620 mm, height 125 mm  
external diameter Ø 785 mm  
total weight approx. 118 kg

**Product information**

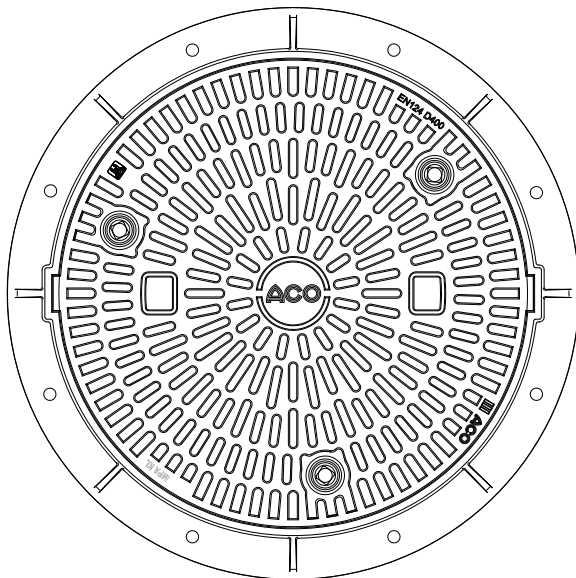
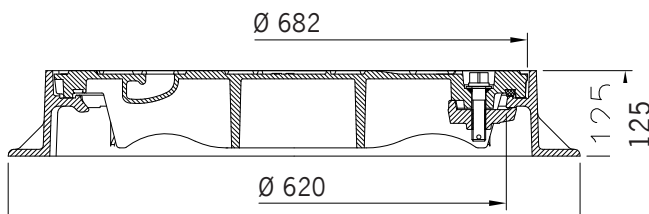
**Accessory**

- opening tools  
**Art. no. 85518**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Black<br>coated | Art. no. |
|-------------------|-----------------|---------------|-----------------|----------|
| 118               | 10              | –             | –               | 604491   |



**ACO MultiTop backflow safe – D 400, CO 620**  
according to DIN EN 124/DIN 1229



**Product description**

**ACO MultiTop backflow safe**  
class D 400 according to DIN EN 124  
and DIN 1229

**MultiTop** manhole cover, round  
with three special turnbuckle locking  
devices  
with oil- and fuel-resistant sealing  
cover made of spheroidal graphite cast  
iron (GJS)  
weight approx. 45 kg  
without hinge

**Fix** flanged frame, round  
with anchoring devices  
clear opening 620 mm, height 125 mm  
external diameter Ø 835 mm  
total weight approx. 92 kg

**Product information**

**Accessory**

- opening tools  
**Art. no. 85518**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Black<br>coated | Art. no. |
|-------------------|-----------------|---------------|-----------------|----------|
| 91.5              | 10              | –             | –               | 603956   |



## ACO MultiTop product range CO 800

### The MultiTop added values in larger scale

Cost-effectiveness for operating companies, ease of operation and a contribution to accident prevention were the objectives for the development of the MultiTop product range with 800 mm clear opening. The range consists of a MultiTop manhole cover with its recognised advantages for traffic safety and maintenance and Lift and Bituplan frames for flush-floating installation in bituminous road surfaces, providing reliability and longer operational life for the whole system of manhole top and shaft body. Established individual product performance and benefits were incorporated in this product range and further benefits were added. The choice of two frame types offers flexibility and planning reliability to the specifier as determined by installation requirements.

#### Advantages

- low manhole cover weight of approx. 75 kg and 78 kg
- maintenance free, screwless, non-integrally cast and traffic-safe
- securing features made of high-strength plastic
- easily handled and safe in operation
- reduced amount of maintenance
- cushioning insert within the frame
- increased accident prevention

Construction of drainage/sewerage systems generally uses manhole tops with a clear opening of only 600mm. The small diameter of the opening is often a bottleneck.

Entry and exit are not only arduous and time consuming, but also represent a risk for workers:

- rescue operations are difficult
- ladders can not be used in shafts equipped with a manhole top with a clear opening of 600 mm

To improve security, to facilitate entry and exit and to make use of tools and utilities faster and easier, manhole tops with a clear opening of 800 mm are more and more often considered and installed.

To date, manhole tops with 800 mm clear opening were not easy operable, because of the high cover weight, usually requiring special lifting equipment or, in the case of designs with lighter manhole covers, because traffic safety related devices e.g. screws are maintenance intensive and accident-sensitive.

In most cases solutions with opening aids are neither economical nor reliable. Nevertheless, despite the advantages of manhole tops with a clear opening of 800 mm, decisions are often taken to install a manhole top with a clear opening of 600 mm for the reasons given. This is especially problematic because accident prevention regulations require the use of manhole tops with a clear opening of 800 mm.

### The challenge

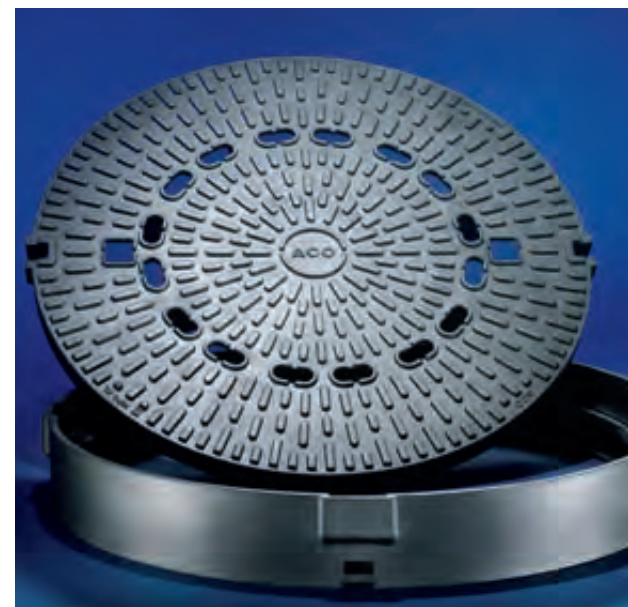
For ACO engineers, the challenge was to develop load class D 400 manhole tops, meeting the following requirements:

- 800 mm clear opening
- low cover weight
- easy and fast handling despite traffic safe securing of the cover to the frame
- minimum maintenance
- high functional and operational reliability
- no noise due to rattling
- reduction of wear
- economical solution

### The solution

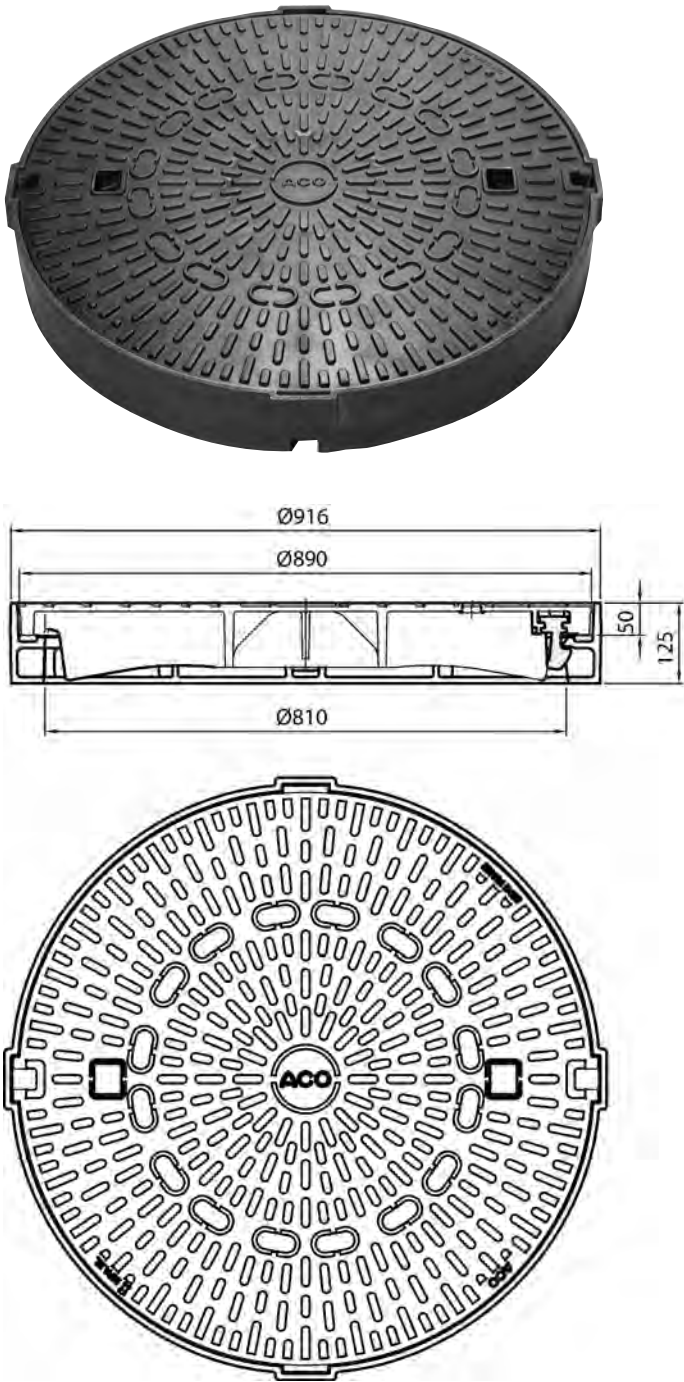
Based on several years of positive experience and recognised characteristics and benefits of the MultiTop CO 605 product range, ACO's CO 800 MultiTop product range offers the most advantageous manhole tops for this application with the following characteristics:

- clear opening 800 mm meeting the requirements of accident prevention regulations
- cover weight approx. 75 kg
- traffic-safe and easily handled due to screwless locking device
- minimal maintenance due to maintenance-free, screwless locking feature
- high functional and operational reliability due to self-locking feature
- less noisy, no rattling due to cushion insert
- wear reduction due to cushion insert within the frame
- benefiting from established advantages of Lift and especially Bituplan frames
- economical solution because of the added value features





**ACO MultiTop Lift – D 400, CO 800**  
**according to DIN EN 124/DIN 1229**



**Product description**

**ACO MultiTop Lift manhole top**  
class D 400 according to DIN EN 124 and DIN 1229

**MultiTop** manhole cover, round, with two high resistant, maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic cover made of spheroidal graphite cast iron (GJS)

weight approx. 75 kg  
without hinge

**Lift** frame, round  
liftable for height adjustment  
with PEWEPREN cushioning insert  
clear opening 800 mm, height 125 mm  
external diameter Ø 915 mm  
bearing pressure 2,8 N/mm<sup>2</sup>  
with or without vent holes  
ventilation cross section 265 cm<sup>2</sup>  
total weight approx. 124 kg

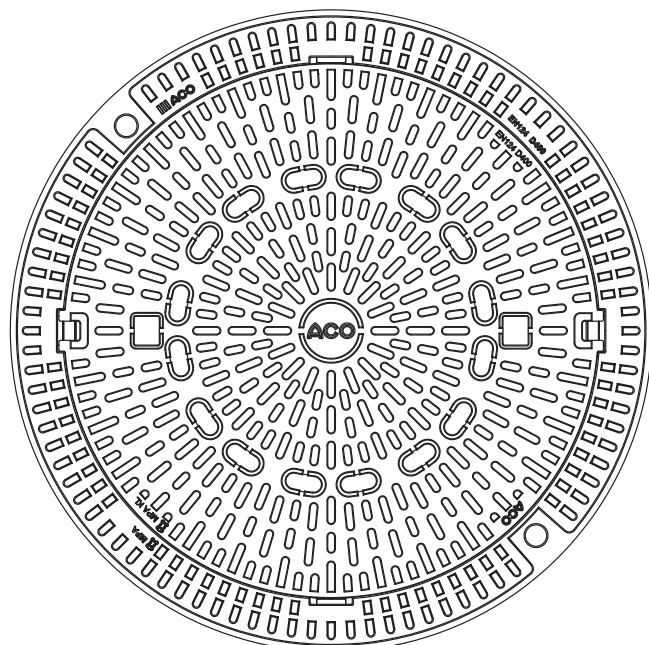
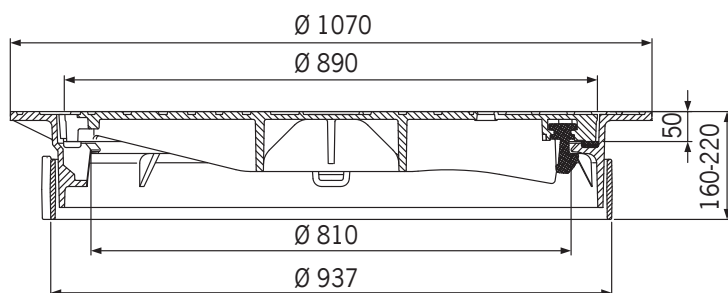
**Product information**

- Variations**
- with/without ventilation – with/without dirt bucket
  - black hydro-based coating
  - coat of arms, logo, inscription
- Accessory**
- opening tools **Art. no. 600643**
  - cushioning inserts **Art. no. 60279**
  - dirt bucket for covers with vent holes **Art. no. 57188**

| Weight [kg/pc] | Package unit | Vent holes | Black coated | Art. no. |
|----------------|--------------|------------|--------------|----------|
| 123            | 5            | ×          | –            | 602508   |
| 125            | 5            | –          | –            | 602509   |
| 123            | 5            | ×          | ×            | 603482   |
| 125            | 5            | –          | ×            | 603846   |

## ACO MultiTop Bituplan – D 400, CO 800

according to DIN EN 124/DIN 1229



### Product description

**ACO MultiTop Bituplan manhole top system**  
class D 400 according to DIN EN 124  
and DIN 1229

for flush-floating installation in bituminous  
road structure

**MultiTop** manhole cover, round,  
with two high resistant, maintenance free,  
screwless, non-integrally cast and  
traffic-safe securing features made of  
high-strength plastic

cover made of spheroidal graphite cast  
iron (GJS),

weight approx. 75 kg

without hinge

**Bituplan** frame, round  
for flush-floating installation in bituminous  
road structure

with PEWEPREN cushioning insert  
clear opening 800 mm, height 160 mm

**installation height min. 170 mm**

**up to max. 230 mm,**

external diameter Ø 1070 mm

bearing pressure 1,5 N/mm<sup>2</sup>

**with adapter ring**

with or without vent holes

ventilation cross section 265 cm<sup>2</sup>

total weight approx. 174 kg

### Product information

#### Variations

- with/without ventilation –  
with/without dirt bucket
- black hydro-based coating
- coat of arms, logo, inscription

#### Accessory

- opening tools **Art. no. 600643**
- cushioning inserts **Art. no. 602794**
- installation shuttering (reusable) –  
**Art. no. 210132**
- dirt bucket for covers with vent holes  
**Art. no. 57188**

| Weight<br>[kg/pc] | Package<br>unit | Vent<br>holes | Black<br>coated | Art. no.      |
|-------------------|-----------------|---------------|-----------------|---------------|
| 173               | 5               | ×             | –               | <b>10426</b>  |
| 175               | 5               | –             | –               | <b>10428</b>  |
| 173               | 5               | ×             | ×               | <b>210287</b> |
| 175               | 5               | –             | ×               | <b>210288</b> |



ACO MultiTop with city arms



ACO MultiTop cover with city arm and round frame made of cast iron

## ACO manhole tops in alternative designs

### Individually designed

ACO offers complete solutions for street casting and drainage technologies: additional manhole tops in square or round shape, providing established features or fulfilling new requirements, flexibly combined and adapted to the relevant needs or building an element of individual designs.

#### Personal Note

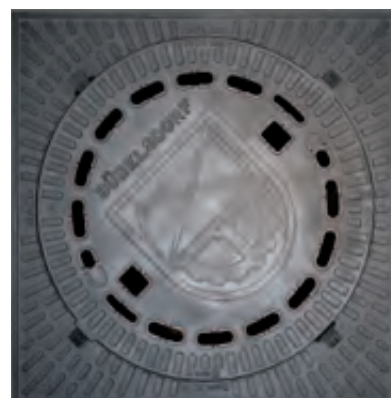
Whether square or round shape- ACO manhole tops can be provided with a personalised inscription or your company logo and therefore create individual decorative design elements in driveways or parking areas of private homes, public areas or corporate offices.

#### Coats of arms

Traditional coats of arms can be incorporated in the design of the manhole cover. These manhole covers beautify the cityscape and enhance the street's appearance.

#### Optional surface

ACO manhole covers can be filled with materials of the surrounding area, thereby forming an integrated unit with the surrounding pavement. Manhole covers with user-chosen infills give the designer many opportunities for unique aesthetics, whilst providing functional solutions.



ACO MultiTop cover with city arm and square frame made of BEGU



Manhole cover with pavement filling



## Assembly instruction for anti-theft protection retrofit kit for CityTop manhole covers

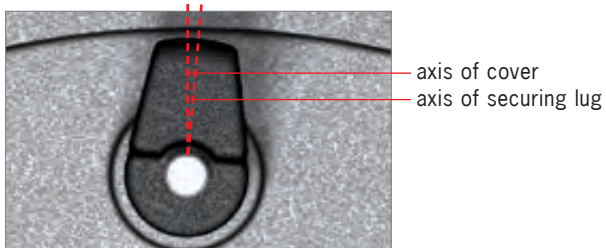
1.1 Mount the washer on the screw and insert the screw into the anti-theft device hole



2. Fasten the securing lug on the screw from the bottom side of the cover



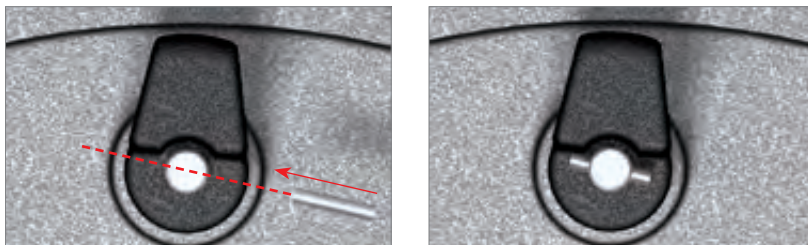
3. Tight the screw whilst paying attention to the position of the securing lug as shown on the picture



4. To fix the securing lug, knock in the rivet into the borehole of the screw.

Repeat step 1-4 at the second borehole

Note: to knock in the rivet, the borehole of the screw shall be parallel to the backside of the securing lug



5. Release both screws and place the cover within the frame. Fasten the screws from top of the cover to lock the securing lug. The anti-theft retrofit kit is mounted and the manhole cover protected against stealing.





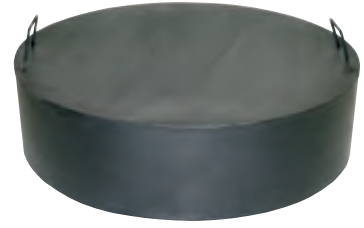
## Bituplan – Installation guide CO 605/CO 800



Manhole cover and frame Bituplan



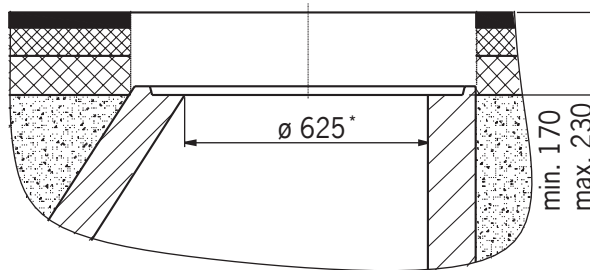
Adaptor ring



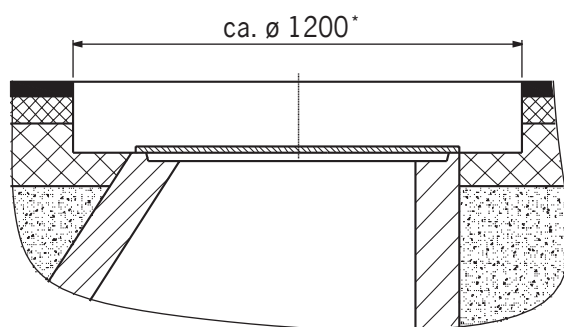
Installation shuttering

### Installation of manhole cover when building a new road

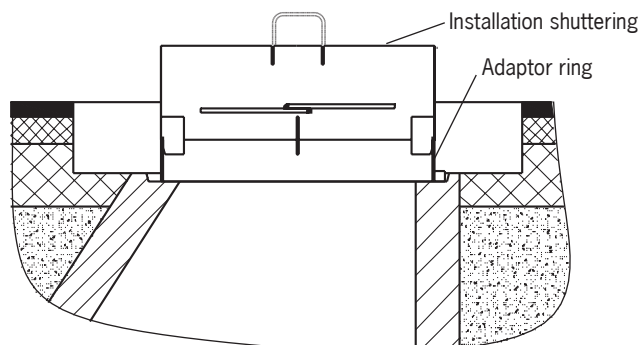
- 1.1 By means of common adjustment rings, bring upper edge of shaft to required installation height of manhole cover, i. e. 160 to 220 mm below upper edge of ready road level.



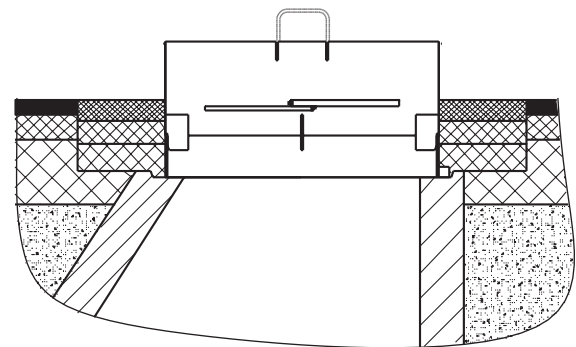
- 1.2 Mark the shaft location at the road edge or kerbstone.  
1.3 Cover the manhole opening with a steel plate.  
1.4 Fit the carrier layer.  
1.5 Fit the binder layer.  
1.6 Fit the covering layer.  
1.7 Uncover the shaft head, i.e. remove the applied layers and take out the steel plate.



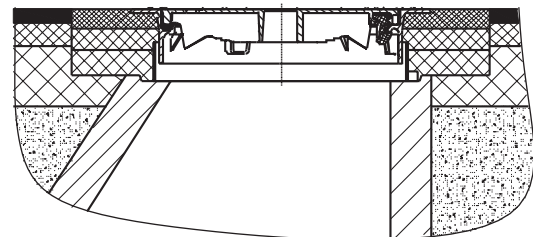
- 1.8 Fit the adaptor ring to the shaft neck.  
1.9 Insert the installation shuttering in the adaptor ring.



- 1.10 Fill the existing recess outside the installation shuttering with hot mixed bitumen substance, flush with the surface, in layers of 40 – 80 mm, and compress tightly.



- 1.11 Carefully draw the installation shuttering towards the top and insert the complete manhole cover.



- 1.12 Vibrate or roll in the manhole cover with the aid of a vibration roller or plate weighing at least 110 kgs and of a minimum impact force of 20 kN, flush with the surface.

As an alternative to the above installation sequence, and when building a new road, the manhole cover can also be fitted whilst building up the upper structure.

\* Dimensioning suitable for CO 605

### Fitting the manhole cover when building a new road whilst building up the upper structure

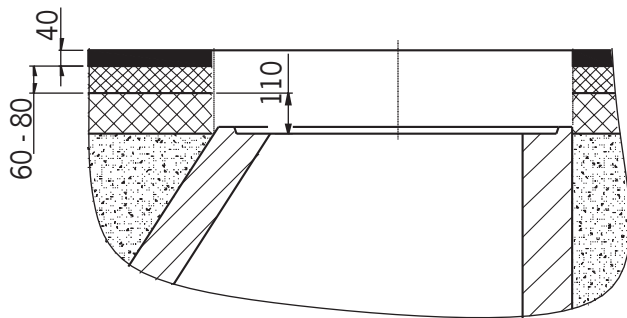
An optimum installation sequence applies to roads of normal layer thicknesses of:

- Binder layer: 60 to 80 mm,
- Top layer: approx. 40 mm,

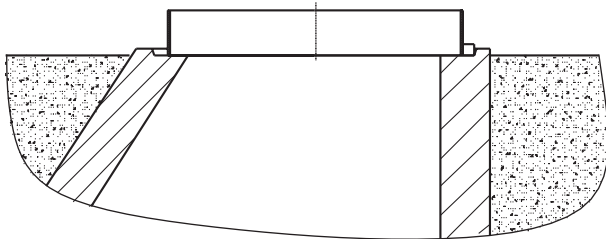
if the upper edge of the shaft head or adjustment ring is located about 100 mm below the upper edge of the carrier layer.

We recommend to adopt the following steps:

- 2.1 By means of common adjustment rings, bring upper edge of shaft to required installation height of manhole cover, i. e. 100 mm below upper edge of carrier layer.



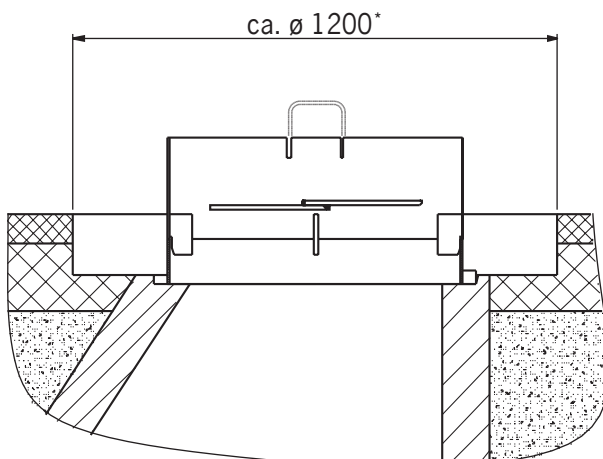
- 2.2 Fit adaptor ring to shaft neck.



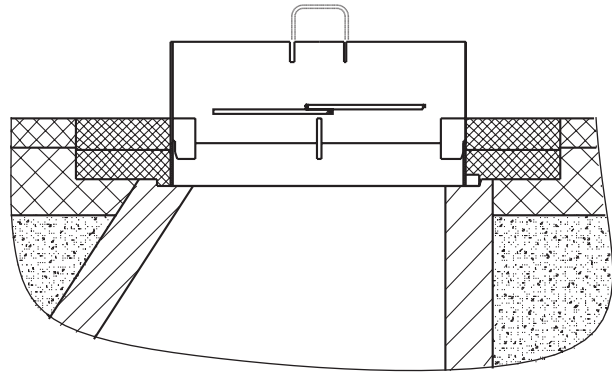
- 2.3 Mark shaft location at the road edge or kerbstone.  
2.4 Cover the manhole opening with a steel plate.  
2.5 Fit carrier layer and uncover the steel plate located on shaft.  
2.6 Fit binder layer.

**Caution!!** Prior to compacting binder layer, following steps have to be performed:

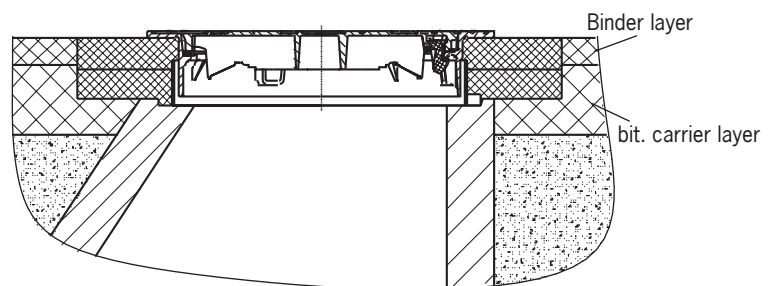
- a) Uncover and remove the steel plate located on shaft.  
b) Apply installation shuttering.



- c) Fill the existing recess outside the installation shuttering with hot mixed bitumen substance, flush with the surface, in layers of 40 – 80 mm, and compress tightly.



- d) Carefully draw the installation shuttering towards the top and insert the complete manhole cover.



- e) Roll in the manhole cover flush with the surface.  
f) Before fitting the top layer, we recommend to remove the frame from the binder layer with the aid of a pick axe or crowbar.

In order to prevent bitumen from adhering, the cover surface should be thinly spread with sand or covered by a tin plate before fitting the top layer.

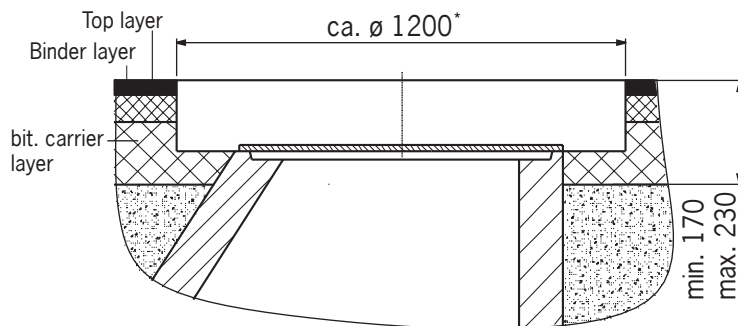
- 2.7 Fit top layer  
2.8 Expose the cover  
2.9 Draw the cover towards the top and add hot mixed substance below the upper protruding edge over the entire surface and surface-flush with the adjoining covering.  
2.10 Press the cover down until the underside of the protruding edge makes contact.  
2.11 Roll in the cover flush with the surface.

### Installation of the manhole cover when renovating existing shaft

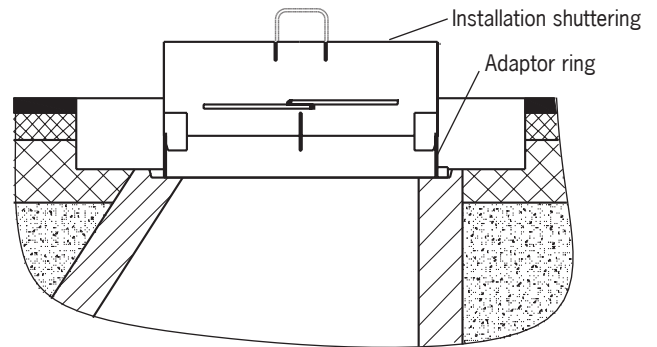
Thanks to the variable height of min. 170 mm to max. 230 mm, MultiTop manhole covers Bituplan system can be used without problems for renovation of shafts with manhole covers as per DIN 19584 (frame height 160 mm) in existing bituminous traffic lanes.

Working sequence:

- 3.1 Ream out and remove an area of a diameter of about 120 cm round the fitted manhole cover.
- 3.2 Remove existing manhole cover and check shaft head. Remove and replace loose and damaged components.
- 3.3 Bring upper edge of shaft to required installation height, i. e. 170 to 230 mm below road level; fit adjustment rings as per DIN 4034, if required.



3.4 Apply adaptor ring to shaft head.

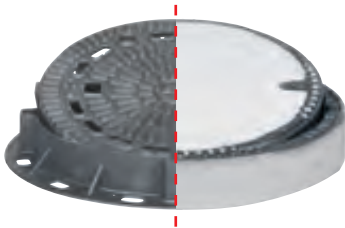


- 3.5 Insert installation shuttering art. no. 64476 and fill the recess outside the installation shuttering with hot mixed substance in layers of 40 – 80 mm, flush with the surface, and compress tightly. In order to achieve adequate stability, the layer structure of the area to be repaired has to correspond to that of the covering structure of the road. Only about the last 4 cm of the recess may be filled with fine-grained cover layer material. The layers below have to be filled with the relatively coarse-grained mixed substance which is normally used for the carrier layer.
- 3.6 Carefully draw installation shuttering and insert manhole cover.
- 3.7 Vibrate in the manhole cover with the aid of a vibration roller or plate weighing not less than 110 kgs and of an impact stress of at least 20 kN, flush with the surface. When working with the vibration roller, first roll over the repair area without vibration switched on, then roll in the cover with vibration switched on, flush with the surface. The road can be opened for traffic when the bituminous material has cooled down.

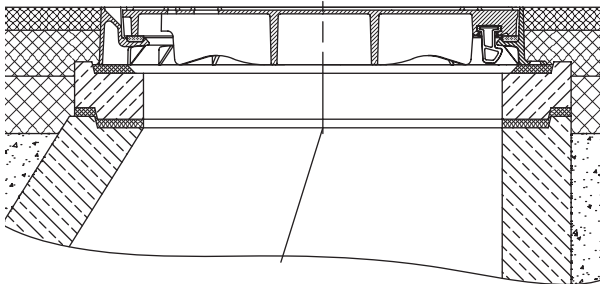
## Fix and Lift – Installation guide

Prior to installation of Fix and Lift frames, clean and moisture contact surfaces of shaft upper component and frame underside. Fit manhole covers at correct height to a full-surface mortar bed and align. Use mortar MG III as per DIN 1053 or relevant shaft compound mortar (e.g. Ebralit).

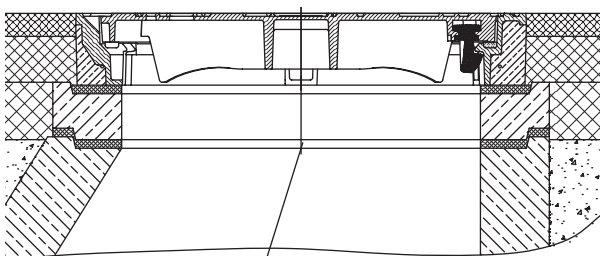
Height of mortar bed should be approx. 20 mm. Insert cover only after mortar has set. Then apply road covering. Load of manhole cover by traffic after mortar has set, only after 72 hours. If required, use quick-setting concrete or quick-setting shaft compound mortar.



Manhole cover and frame Fix/Lift



Installation of Fix frame



Installation of Lift frame





MultiTop bridge drains

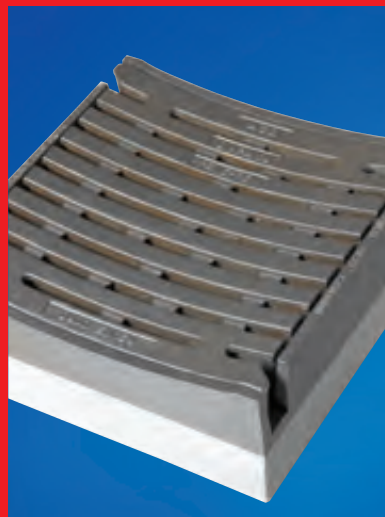


MultiTop gully top

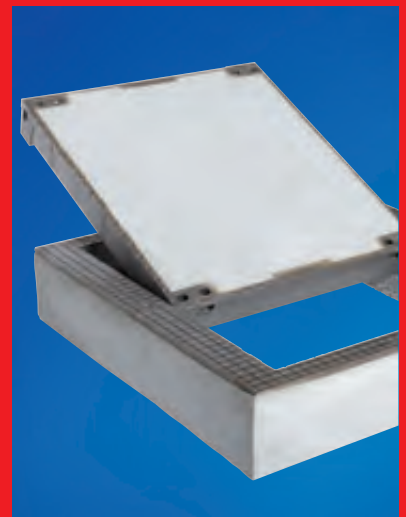
Combipoint System



ClassicTop gully top



Cable duct covers

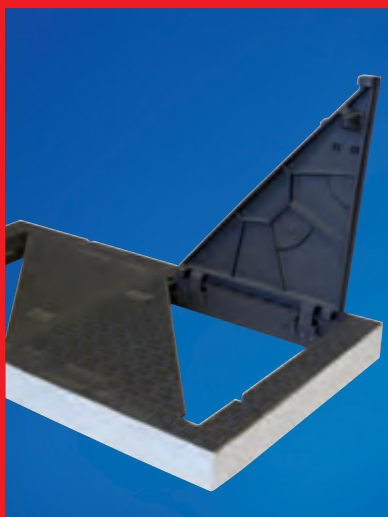




Channel gratings

## *Solutions for infrastructure and drainage technology*

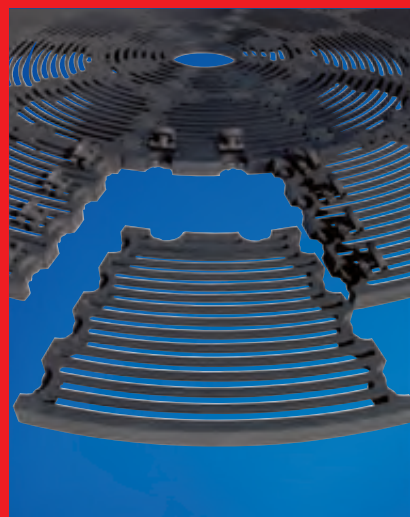
Trigona double triangular covers



Secant and Servocat multipart covers



Tree grilles



### **ACO construction casting product ranges**

ACO is in the front rank when it comes to innovative solutions for infrastructure. A complete range of line and point drainage and street castings is available.

ACO systems are used in a variety of application fields. Their innovative technologies are aimed at meeting the increased demands of the future: increasing traffic volumes, environmental changes, responsible use and treatment of water resources and greater overall cost-effectiveness.

- Manhole tops and gully tops
- Street and courtyard drains
- Bridge drainage
- Cable duct covers for telecommunication chambers
- Tree grilles
- Channel gratings



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