





ACO Passavant Detego GmbH (ACO PD) is **the manufacturing company of the ACO Group** for the manhole covers and gully tops business segment.

Development  
Sourcing  
Production  
Quality Management  
Certification  
Logistics  
Marketing support

**A team of specialists supports you** in developing a suitable business model for your market - including compiling a product range, new developments **and training your employees on site, at the Aarbergen plant or ACO GUSS foundry.**

The large area in Aarbergen offers excellent capacities for storage.

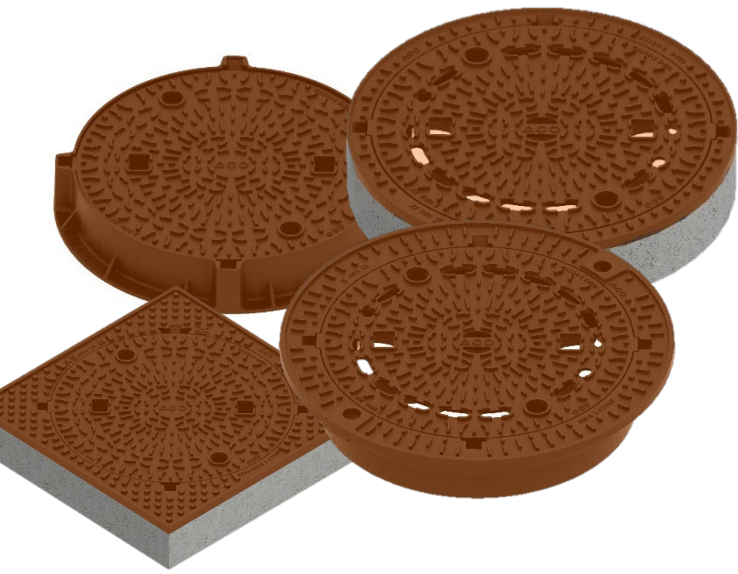




ACO Citytop Plus

International product series





## **Citytop Plus is a new series.**

Until the complete Citytop PLUS series is available we introduce a 'made in EU' edition with similar features:

modern new ACO design

leightweight covers 35/37kg

Natural - uncoated, rosty

TPU blocking + optional turnbuckle locking

Bituplan frames with Multitop technology with 4 part high value cushioning insert, machined seating below the rubber  
Square and round BEGU frames. Fix100 frame.

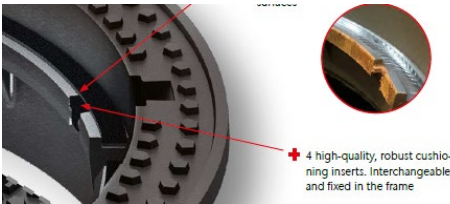
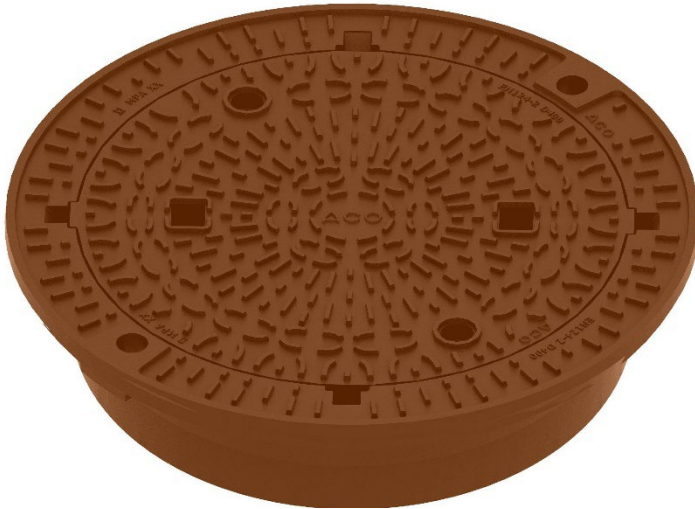
### **Citytop P series:**

is not available any more.

### **Citytop S Series:**

only available with Fix75 and Bituplan120 frames

# Citytop Plus Bituplan160



- EN 124**
- D400**
- 605mm**
- Anti-theft**

## Product description

**ACO Citytop Plus manhole cover**  
 Class D400 / DIN EN 124-2 **CityTop** manhole cover, round, clear opening 600 mm  
 Natural surface - Without black coating

Lid made of ductile cast iron EN-GJS-500-7

- with ventilation openings
  - without ventilation openings
- with two screwless lockings made of wear-resistant plastic and optional device for turnbuckle bolt, optional customization by logo or inscription, lid weight approx. 37/35 kg

Bituplan frame for installation into asphalt, with 4 exchangeable PEWEPREN cushioning inserts, machined seating, including pockets for entrance aid, frame height 160 mm

Total weight approx. 89 / 91 kg

## Product information

### Accessories

- Operating tool **600643**
- Locking set **210248**

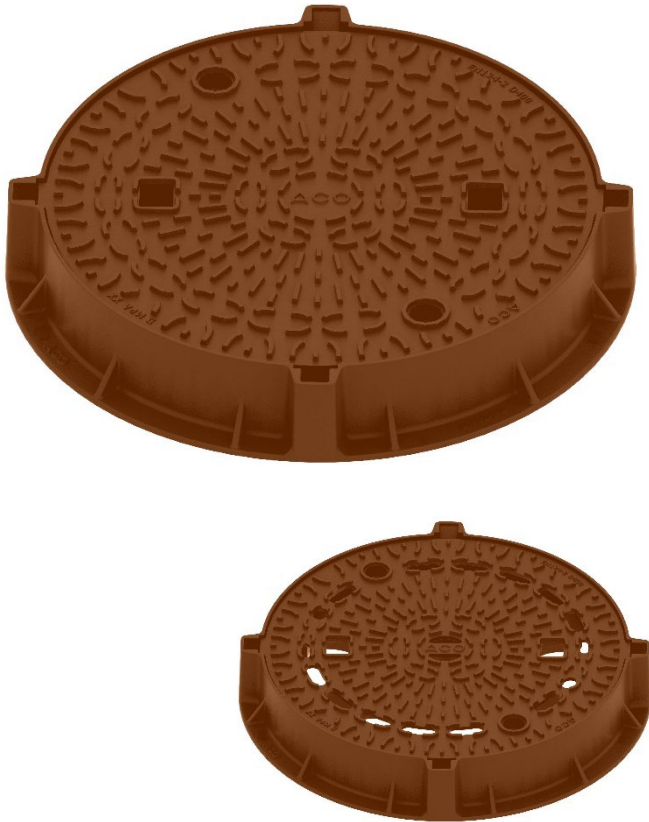
## Advantages

- Safe positioning of the cover due to an additional stabilization groove
- Easy installation also in case of refurbishment with the 100 mm fix frame
- Durable PEWEPREN cushioning insert

skirt OD mm	Pcs / pallet	Ventilation holes	Weight kg	Item-no.
695		X	89	1207919
695		-	91	1207920

# Citytop Plus Fix100

Spring 2022



## Product description

### ACO Citytop Plus manhole cover

Class D400 / DIN EN 124-2 **CityTop** manhole cover, round, clear opening 600 mm  
Natural surface - Without black coating

Lid made of ductile cast iron EN-GJS-500-7

- with ventilation openings
  - without ventilation openings
- with two screwless lockings made of wear-resistant plastic and optional device for turnbuckle bolt, optional customization by logo or inscription, lid weight approx. 37/35 kg

Round frame with flange, with PEWEPREN cushioning insert, frame height 100 mm, OD 780 mm, no pockets for dirt pans

Total weight approx. 60 / 62 kg

## Product information

### Accessories

- Operating tool **600643**
- Locking set **210248**

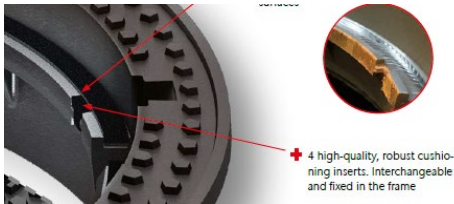
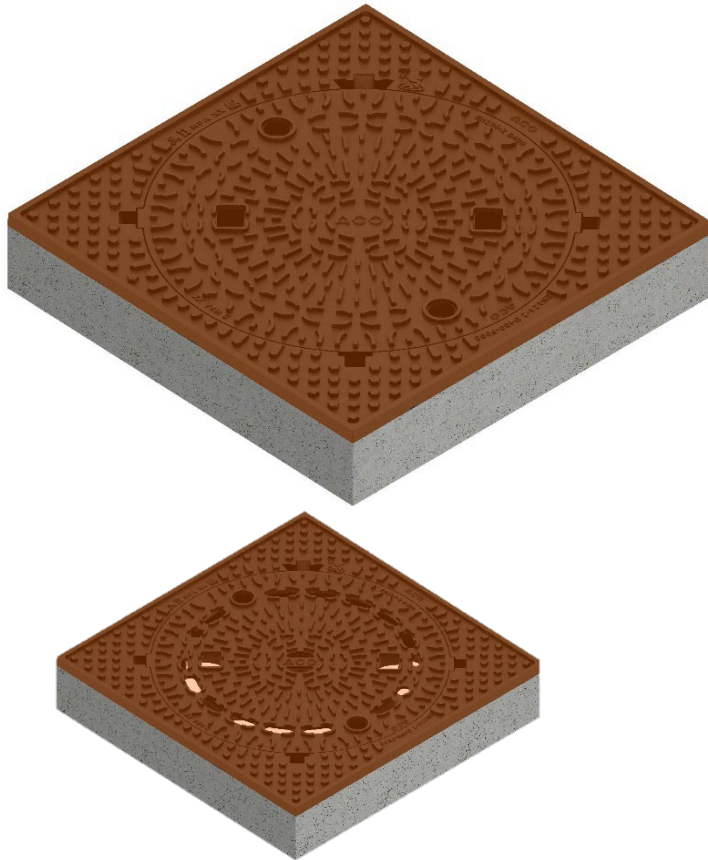
## Advantages

- Safe positioning of the cover due to an additional stabilization groove
- Easy installation also in case of refurbishment with the 100 mm fix frame
- Durable PEWEPREN cushioning insert

- ✓ EN 124
- ↓ D400
- ⊘ 605mm
- ⬡ Anti-theft

Flange OD	Pcs / pallet	Ventilation holes	Weight kg	Item-no.
780	16	X	60	1207911
780	16	-	62	1207912

# Citytop Plus BEGU QUAD125



- EN 124**
- D400**
- 605mm**
- Anti-theft**

## Product description

**ACO Citytop Plus manhole cover**  
 Class D400 / DIN EN 124-2 **CityTop** manhole cover, round, clear opening 600 mm  
 Natural surface - Without black coating

Lid made of ductile cast iron EN-GJS-500-7

- with ventilation openings
  - without ventilation openings
- with two screwless lockings made of wear-resistant plastic and optional device for turnbuckle bolt, optional customization by logo or inscription, lid weight approx. 37/35 kg

SQUARE BEGU frame, made in cast iron and concrete, with 4 exchangeable PEWEPREN cushioning inserts, machined seating, frame height 125 mm, OD 780x780 mm

Total weight approx. 158 /160 kg

## Product information

### Accessories

- Operating tool **600643**
- Locking set **210248**

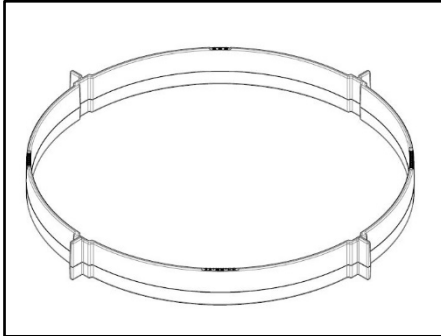
## Advantages

- Safe positioning of the cover due to an additional stabilization groove
- Easy installation also in case of refurbishment with the 100 mm fix frame
- Durable PEWEPREN cushioning insert

OD	Pcs / pallet	Ventilation holes	Weight kg	Item-no.
	10	X	158	1207915
	10	-	160	1207916



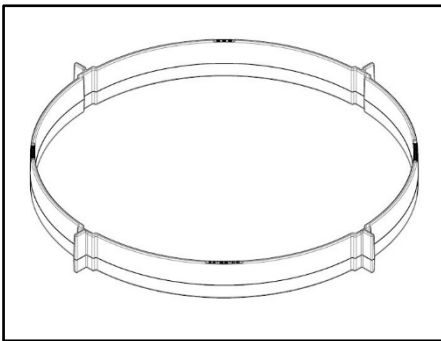
## Accessories



### Adapter ring 80mm

ID 708mm, 11kg  
To install 140mm Bituplan covers in a height of 160-200

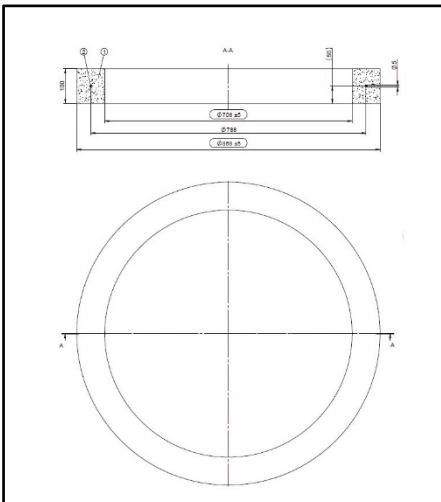
Article 1204755  
Made of cast iron



### Adapter ring 100mm

ID 708mm, 13kg  
To install 160mm Bituplan covers in a height up to 240

Article 1204754  
Made of cast iron



### Concrete Adapter ring

ID 708mm

Article 1203746, 48 kg, height 100mm  
Article 1203745, 38 kg, height 80mm

Made of concrete

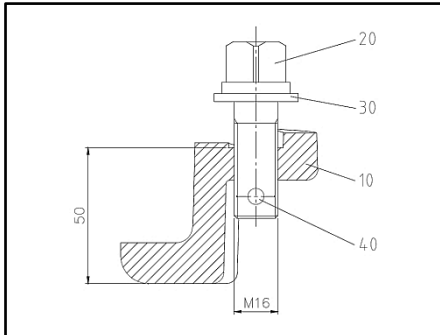


### Installation formwork / shuttering (reusable)

For Bituplan covers  $\varnothing$  600 mm  
OD 718mm

Article 64476  
Weight 10 kg  
Made of steel

## Accessories

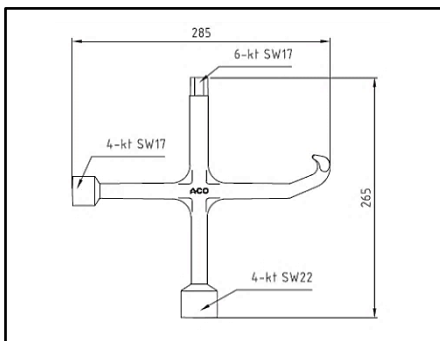


### Anti-theft kit

For Citytop Plus ,Edition Pure', Citytop Plus / P and S

Article 210248

Weight 1,2 kg



### Opening- and lifting tool

Article 85518 / 4143.00.00

Weight 1,3 kg

Made of cast iron



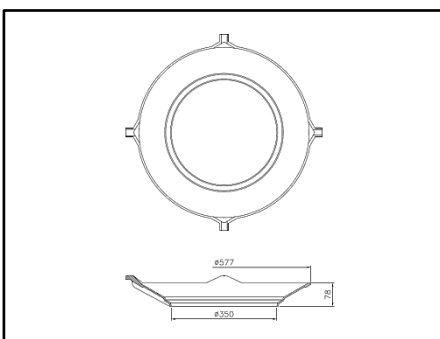
### Opening- and lifting tool

length 600 mm

Article 600643

Weight 1,5 kg

Made of steel



### Funnel with bucket support

For inlet gratings  $\varnothing$  600 mm  
to use buckets acc. to DIN4052

Article 85621 / 4750.00.00

Weight 12 kg

Made of cast iron



ACO Citytop manhole covers

International product series

For internal use only



# Citytop One S

Full container loads directly to your stock.

**Please start to order from  
september 2021:**  
without ventilation  
380pc./ container  
delivery time 3-4 month

Spring 2022



Light. Inexpensive. Foldable.

In the 20th century, manhole covers were mostly 140-190 kg heavy (frame + cover). Today - despite a massive increase in traffic loads on our roads - manhole covers with a weight of less than 55 kg are available... Citytop One is a light, inexpensive lid with an elegant design - locked, black coated and ergonomic to open.

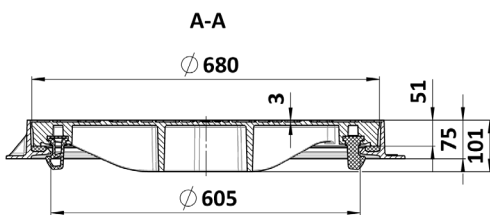
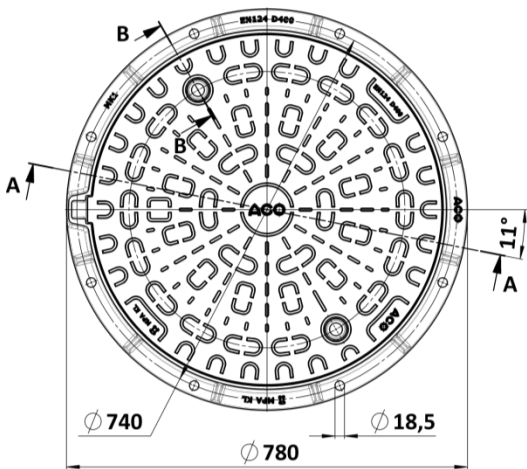
### Product benefits

- lightweight lid made of ductile cast iron EN GJS500-7
- load class D 400, EN124-2 certified
- clear opening 600 mm
- damping insert in the lid
- interlock system for lid / cover
- black coated surface
- lid – minimum weight 31 kg
- tumbuckle lock optional

without ventilation: 1206877  
with ventilation: 1207244



# CityTop S Fix 75



- EN 124**
- D400**
- 605mm**
- Anti-theft**

## Product description

**ACO CityTop S Fix 75 manhole cover**  
 Class D 400 according to DIN EN 124  
**CityTop S** 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. 36/41 kg  
**Fix** flanged frame, round, height 75 mm  
 external diameter 780 mm, max. bearing  
 pressure 3,6 N/mm<sup>2</sup>, ventilation cross section  
 520 cm<sup>2</sup>, total weight approx. 56/61 kg

## Product information

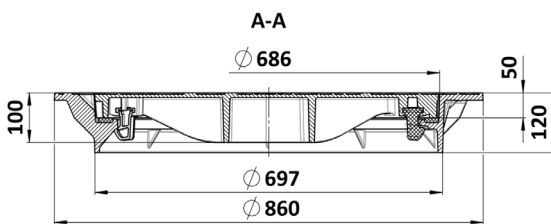
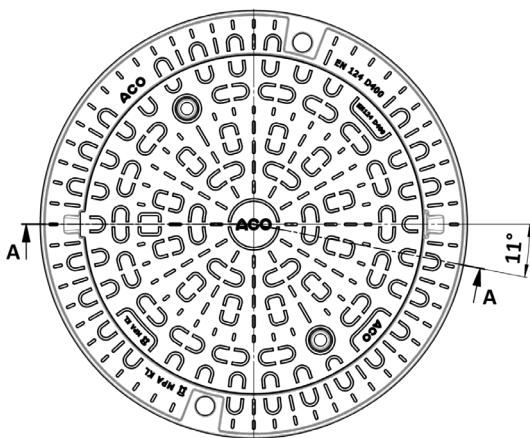
- Variations**
- Black hydro-based coating
  - Logo cover
- Accessories**
- Operating tool **600643**
  - Anti-theft protection kit **210248**

## Advantages

- Safe positioning of the cover due to an additional stabilization groove
- Easy installation also in case of refurbishment with the 75 mm fix frame
- Durable PEWEPREN cushioning insert

Weight [kg]	Pcs./pallet	Ventilation holes	coating	Item no.
56	16	x	-	1015545
61	16	-	-	1201099

# CityTop S Bituplan 120



## Product description

### ACO CityTop S Bituplan manhole cover

Class D 400 according to DIN EN 124

**CityTop S** 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. 36/ 41kg

**Bituplan** self-leveling frame, round, height 120 mm, external diameter 860 mm, max. bearing pressure 1,6 N/mm<sup>2</sup>, total weight approx. 78,5-81 kg

## Product information

### Variations

- Logo cover

### Accessories

- Operating tool **600643**
- Anti-theft protection kit **210248**
- Adaptor ring h80 of Cast iron, steel or concrete

## Advantages

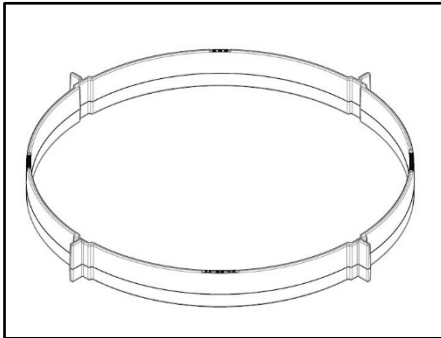
- Self-leveling frame with a max. bearing pressure of 1,6 N/mm<sup>2</sup>
- Safe positioning of the cover due to an additional stabilization groove
- Easy installation also in case of refurbishment with the 120mm Bituplan frame
- Durable PEWEPREN cushioning insert

- ✓ EN 124
- ↓ D400
- ⊘ 605mm
- ⬡ Anti-theft

Weight [kg]	Pcs / pallet	Ventilation holes	Black coating	Item-no. w/o adapter ring
78,5	18	x	-	1202998
81	18	-	-	1203000

Item-nos for version with adapter ring on request

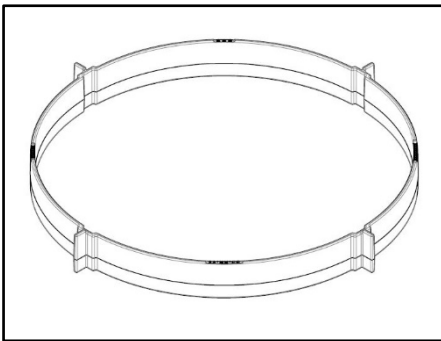
## Accessories



### Adapter ring 80mm

Internal diameter 708mm, 11kg  
To install 140mm Bituplan covers in a height of 160-200

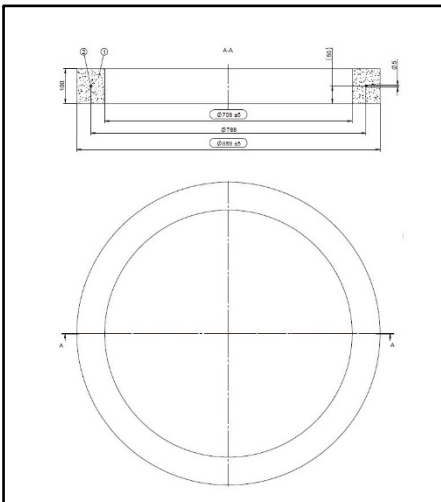
Article 1204755  
Made of cast iron



### Adapter ring 100mm

Internal diameter 708mm, 13kg  
To install 160mm Bituplan covers in a height up to 240

Article 1204754  
Made of cast iron



### Concrete Adapter ring

Internal diameter 708mm

Article 1203746, 48 kg, height 100mm  
Article 1203745, 38 kg, height 80mm

Made of concrete

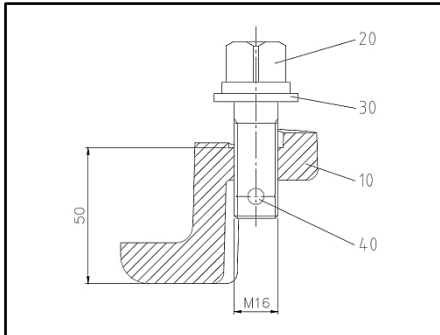


### Installation formwork / shuttering (reusable)

For Bituplan covers  $\varnothing$  600 mm

Article 64476  
Weight 10 kg  
Made of steel

## Accessories

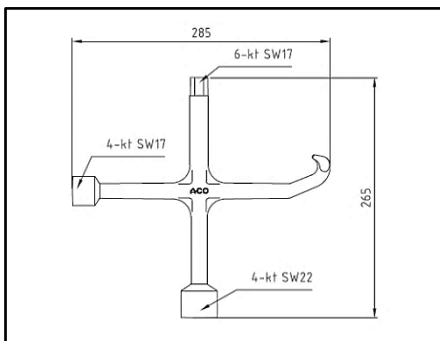


### Anti-theft kit

For Citytop Plus ,Edition Pure', Citytop Plus / P and S

Article 210248

Weight 1,2 kg



### Opening- and lifting tool

Article 85518 / 4143.00.00

Weight 1,3 kg

Made of cast iron



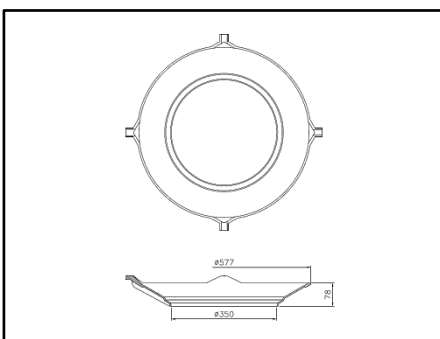
### Opening- and lifting tool

length 600 mm

Article 600643

Weight 1,5 kg

Made of steel



### Funnel with bucket support

For inlet gratings  $\varnothing$  600 mm  
to use buckets acc. to DIN4052

Article 85621 / 4750.00.00

Weight 12 kg

Made of cast iron





Citytop Plus Inspection / Pipetop P Covers & Grating




for inspection shafts or Gullies D400

For internal use only



# Citytop Plus Inspection / Pipetop P D400

Frame skirt to put over the pipes

	Cover	Grating
Ø 315 mm		
Article	1207114	TBD
Ø 500 mm		
Article	1207108	



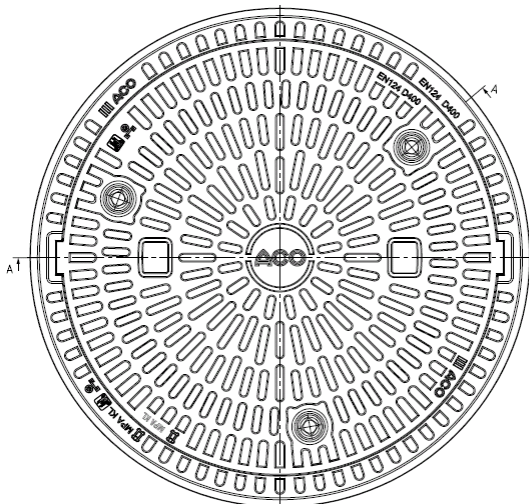
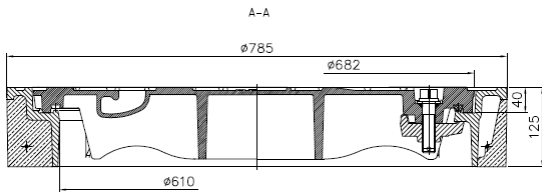
manhole cover larger sizes, watertight

Inter Company product information

For internal use only



# Multitop surface waterproof



## Product description

**ACO Multitop surface waterproof**  
 Class D 400 according to DIN EN 124  
**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

**Lift BEGU frame, round**  
 Clear opening 620 mm, height 125 mm,  
 external diameter 785 mm,  
 total weight approx. 120 kg

## Product information

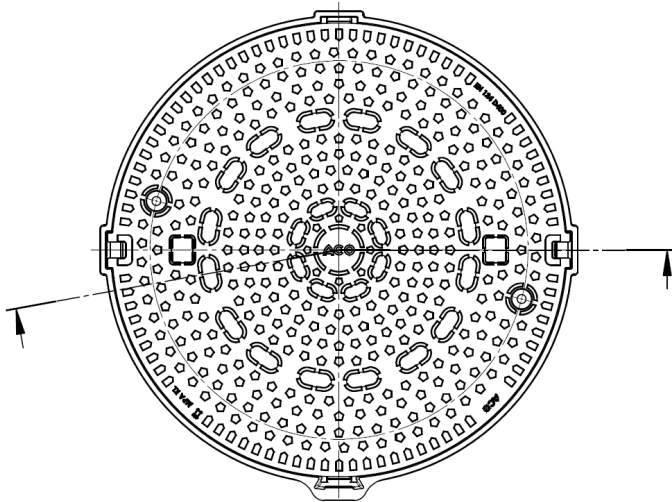
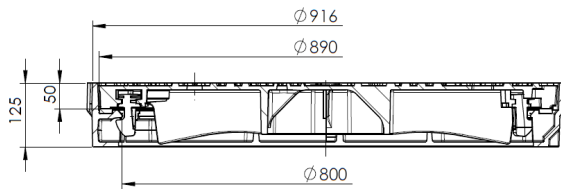
- Variations**
- Black hydro-based coating

- Accessories**
- Opening tool **85518**

- ✓ EN 124
- ↓ D400
- ⊘ 605mm
- ⬡ Anti-theft

Weight [kg]	Pcs./pallet	Ventilation holes	Black coating	Item no.
120	10	-	-	604491
120	10	-	X	604492

# Multitop Lift – Clear opening 800 mm



## Product description

**ACO Multitop Lift manhole top**  
 Class D 400 according to DIN EN 124  
**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

**Lift frame, round**  
 Lifiable for height adjustment  
 with PEWEPREN cushioning inserts  
 Clear opening 800 mm, height 125 mm,  
 external diameter 915 mm,  
 total weight approx. 124 kg

## Product information

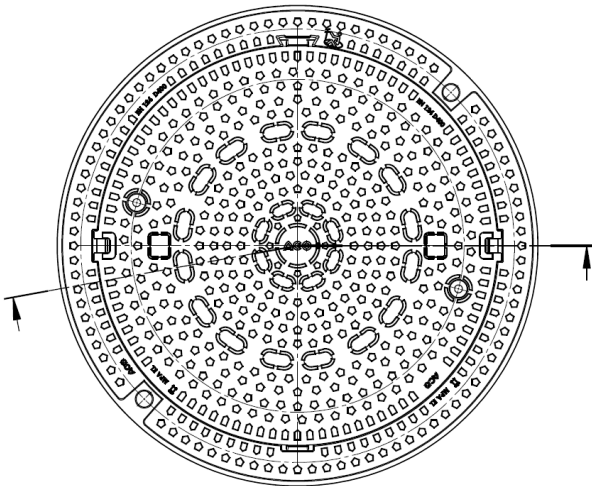
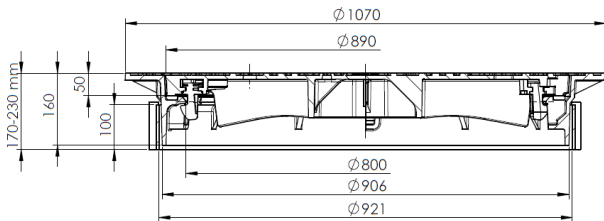
- Variations**
- Black hydro-based coating
  - Logo cover

- Accessories**
- Opening tool **600643**
  - Dirt bucket **57188**
  - Anti-theft protection kit **210248**

- ✓ EN 124
- ↓ D400
- ∅ 800 mm
- △ Anti slip

Weight [kg]	Pcs./pallet	Ventilation holes	Black coating	Item no.
123	5	x	-	210608
125	5	-	-	210609

# Multitop Bituplan – Clear opening 800 mm



## Product description

**ACO Multitop Bituplan manhole top**  
 Class D 400 according to DIN EN 124  
**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

**Bituplan** frame, round  
 with PEWEPREN cushioning inserts  
 Clear opening 800 mm, height 160 mm,  
 external diameter 1070 mm,  
 total weight approx. 174 kg

## Product information

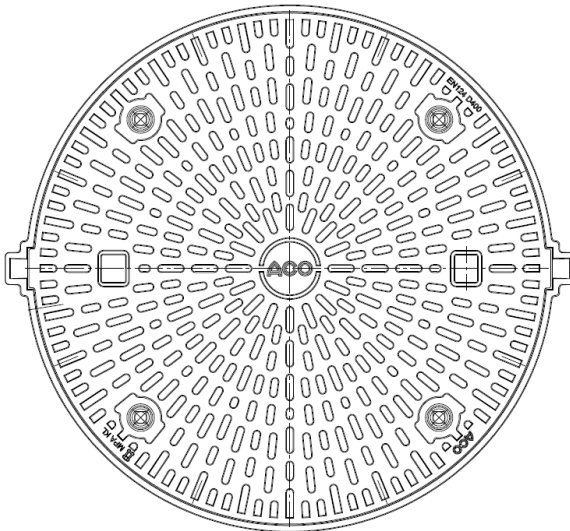
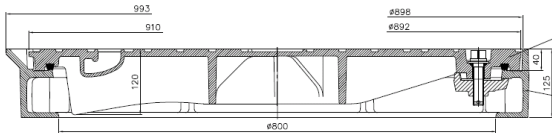
- Variations**
- Black hydro-based coating
  - Logo cover

- Accessories**
- Opening tool **600643**
  - Dirt bucket **57188**
  - Reusable installation shuttering **210132**
  - Anti-theft protection kit **210248**

- ✓ EN 124
- ↓ D400
- ∅ 800 mm
- △ Anti slip

Weight [kg]	Pcs./pallet	Ventilation holes	Black coating	Item-no. with adapter ring
173	5	x	-	210606
175	5	-	-	210607

# Multitop backflow safe – Clear opening 800 mm



## Product description

### ACO Multitop backflow safe

Class D 400 according to DIN EN 124

**Multitop** manhole cover, round, with 4 special turnbuckle locking devices, with oil- and fuel-resistant sealing cover made of spheroidal graphite cast iron (GJS), weight approx. 78 kg

### Frame of cast iron, round

with internal flange, with sand sealing  
Clear opening 800 mm, height 125 mm, external diameter 910/993 mm, total weight approx. 128 kg

## Product information

### Accessories

- Opening tool 85518
- Set of fixing clamps 57184

- ✓ EN 124
- ↓ D400
- ⊘ 800 mm
- ⬡ Anti-theft

Weight [kg]	Pcs./pallet	Ventilation holes	Black coating	Item no.
128	5	-	-	607178



Gully tops and Combipoint System

Inter Company product information

For internal use only





# CityTop P grating

- Further round gratings 315/425/600 you can find in the Pipetop chapter

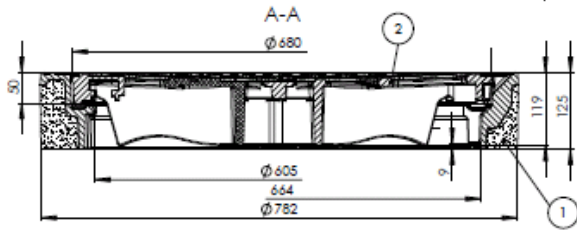


## Product description

### ACO CityTop P grating

Class C250 or D 400 according to DIN EN 124 CityTop P grating, round, made of cast iron, slot width 31 mm, gauge 10 mm, with two maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic,

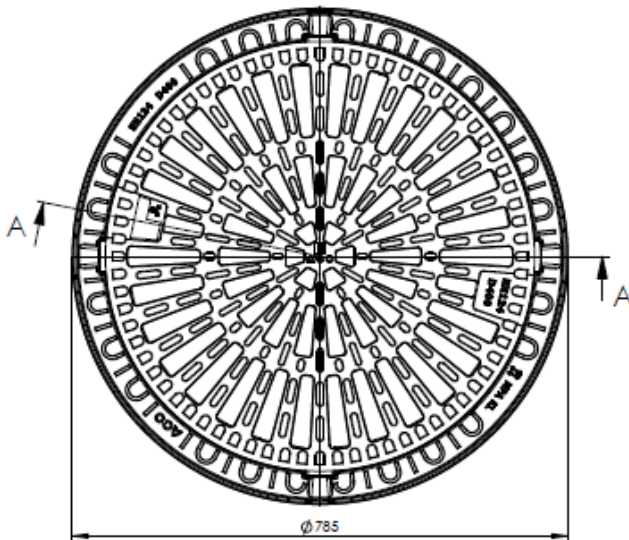
**Lift** frame, round, height 125 mm, external diameter 785 mm, max. bearing pressure 3,6 N/mm<sup>2</sup>, inlet section 1.198 cm<sup>2</sup>, total weight approx. 103-105 kg



## Product information

### Accessories

- Operating tool **600643**
- Funnel with bucket support **4750.00.00**



## Advantages

- Safe positioning of the cover due to an additional stabilization groove
- Concrete C 35/45 is conforming to the highest classification of exposure conditions with freeze-thaw and deicing resistance
- Durable PEWEPREN cushioning insert

- ✓ EN 124
- ↓ C250 / D400
- ⊘ 605mm

Load Class	Weight [kg]	Pcs./pallet	Item-no.
C250	109	10	1204831
D400	109	10	1204832

# Multitop Bituplan 500x500 D400

**NEW in 2022**



## Product description

**ACO Multitop Gully Top**  
 Class D400 according to DIN EN 124  
**Multitop** grating, with four maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. xxxxxxxx kg  
 Frame of cast iron (GJL), Biuplan for asphalt embedding, with **cushioning inserts**  
 external dimensions xxxxx mm,  
 Intake area xxxxx cm<sup>2</sup>,  
 total weight approx. xx kg

## Product information

- Variations**
- Dirt bucket possible acc. DIN 4052-4
  - Black hydro-based coating

## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Frame circumferential closed with removable drainage during construction period
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

- ✓ EN 124
- ↓ D400
- 500x500

Load Class	Weight [kg]	Pcs./pallet	Coating	Item-no.

## Gully Top Ranges

### HighDrain

- CO 400x400 & 500x500
- Load Class C250 & D400
- Maximum intake area
- Frame: fix
- Combipoint: yes
- Source: EU



[page A60](#)

### Multitop

- CO 300x500 & 500x500
- Load Class C250 & D400
- High intake area
- High durability
- Frame: Lift
- Combipoint: yes
- Source: Germany



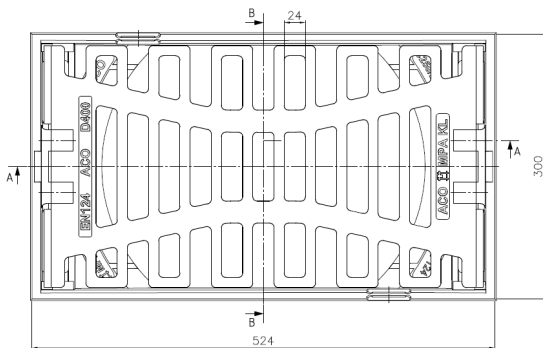
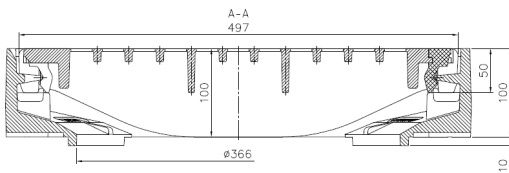
[page A56](#)



**Combipoint** [page A65](#)



# Multitop 300x500 C250/D400



## Product description

**ACO Multitop Gully Top**  
 Class C250 / D400 according to DIN EN 124  
**Multitop** grating, with four maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 14 / 20 kg  
 Frame of cast iron (GJL), liftable, height 100 mm, with **cushioning inserts** external dimensions 300 x 524 mm, Intake area 667 cm<sup>2</sup>, total weight approx. 33 / 38 kg

## Product information

- Variations**
- Dirt bucket possible acc. DIN 4052-4
  - Black hydro-based coating

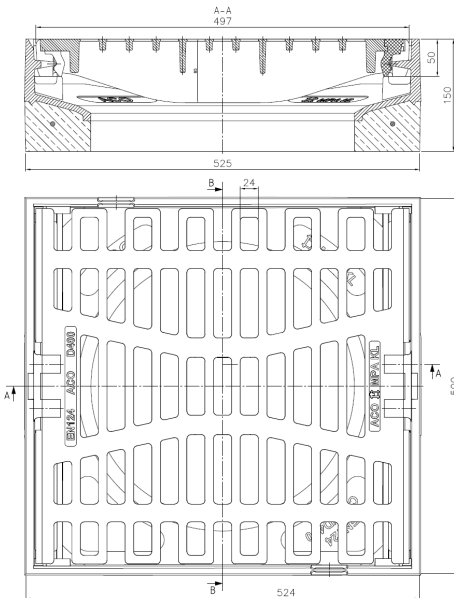
## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Frame circumferential closed with removable drainage during construction period
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

- ✓ EN 124
- ↓ C250 / D400
- 300x500
- ⬡ Anti-theft

Load Class	Weight [kg]	Pcs./pallet	Coating	Item-no.
C250	32,8	30	-	89401
C250	32,8	30	-	89434
D400	37,2	30	x	89405
D400	37,2	30	X	89430

# Multitop 500x500 C250/D400



- ✓ EN 124
- ↓ C250 / D400
- 500x500
- ⬡ Anti-theft

## Product description

### ACO Multitop Gully Top

Class C250 / D400 according to DIN EN 124 **Multitop** grating, with four maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 21/ 28 kg BEGU-Frame of cast iron (GJL) with concrete, liftable, height 150 mm, with **cushioning inserts**, external dimensions 500 x 524 mm, Intake area 1.125 cm<sup>2</sup>, total weight approx. 70 / 77 kg

## Product information

### Variations

- Dirt bucket possible acc. DIN 4052-4
- Black hydro-based coating

## Advantages

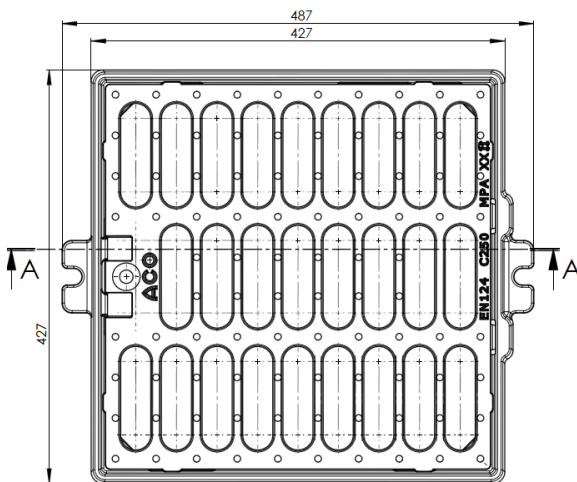
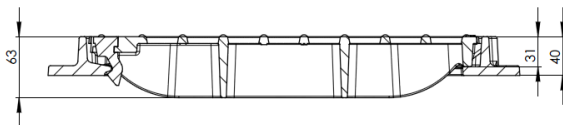
- Full GGG grating with optimized load transmission shaping and high intake capacity
- Frame circumferential closed with removable drainage during construction period
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

Load Class	Weight [kg]	Pcs./pallet	Coating	Item no
C250	70,0	12	-	89403
C250	70,0	12	X	89435
D400	77,0	12	-	89407
D400	77,0	12	X	89431

# HighDrain 400x400 C250



A-A (1:3)



## Product description

**ACO HighDrain S Gully Top**  
 Class C250 according to DIN EN 124  
**HighDrain S** grating, square, with two maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 11 kg  
**Fix** flanged frame, square, height 40 mm, external dimensions 427x427 mm, max. bearing pressure 3,6 N/mm<sup>2</sup>, Intake area 780 cm<sup>2</sup>, total weight approx. 18 kg

## Product information

### Variations

- No dirt bucket possible
- Black hydro-based coating

## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Additional lug segments for a secure installation on the shaft
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

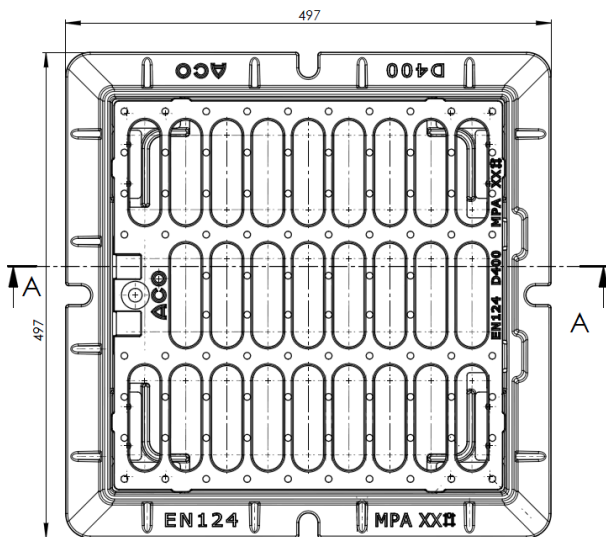
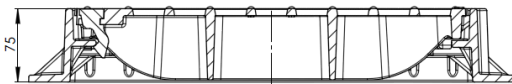
- ✓ EN 124
- ↓ C250
- 400x400
- ⬡ Anti-theft

Load Class	Weight [kg]	Pcs./pallet	Black coating	Item-no.
C250	17,9	40	-	1015540
C250	17,9	40	x	1201214

# HighDrain 400x400 D400



A-A (1:3)



## Product description

**ACO HighDrain S Gully Top**  
 Class D400 according to DIN EN 124  
**HighDrain S** grating, square, with two maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 13 kg  
**Fix** flanged frame, square, height 75 mm, external dimensions 497x497 mm, max. bearing pressure 3,6 N/mm<sup>2</sup>, Intake area 780 cm<sup>2</sup>, total weight approx. 26 kg

## Product information

- Variations**
- No dirt bucket possible
  - Black hydro-based coating

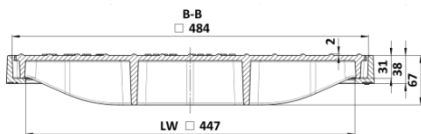
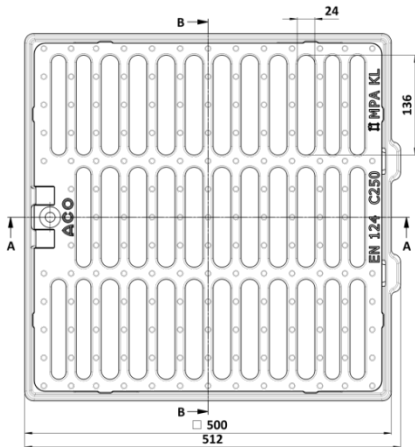
## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Additional lug segments for a secure installation on the shaft
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

- ✓ EN 124
- ↓ D400
- 400x400
- ⬡ Anti-theft

Load Class	Weight [kg]	Pcs./palette	Black coating	Item-no.
D400	25,5	40	-	1203126
D400	25,5	40	x	1203127

# HighDrain 500x500 C250



## Product description

### ACO HighDrain S Gully Top

Class C250 according to DIN EN 124

**HighDrain S** grating, square, with two maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 16 kg

**Fix** flanged frame, square, height 40 mm, external dimensions 512x512 mm, max. bearing pressure 3,6 N/mm<sup>2</sup>, Intake area 920 cm<sup>2</sup>, total weight approx. 22 kg

## Product information

### Variations

- No dirt bucket possible
- Black hydro-based coating

## Advantages

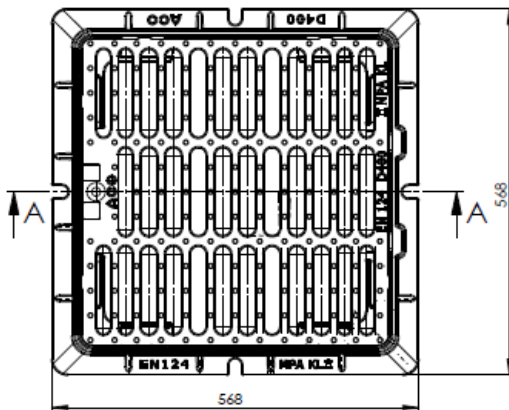
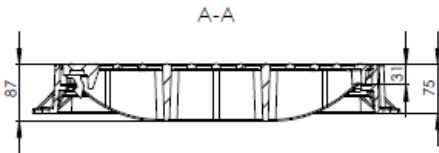
- Full GGG grating with optimized load transmission shaping and high intake capacity
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

- ✓ EN 124
- ↓ C250
- 500x500
- ⬡ Anti-theft

Load Class	Weight [kg]	Pcs./pallet	Black coating	Item-no.
C250	22	40	-	1202889
C250	22	40	x	1202890



# HighDrain 500x500 D400



## Product description

### ACO HighDrain S Gully Top

Class D400 according to DIN EN 124

**HighDrain S** grating, square, with two maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 18 kg

**Fix** flanged frame, square, height 75 mm, external dimensions 568x568 mm, max. bearing pressure 3,6 N/mm<sup>2</sup>, Intake area 920 cm<sup>2</sup>, total weight approx. 34 kg

## Product information

### Variations

- No dirt bucket possible
- Black hydro-based coating

## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

- ✓ EN 124
- ↓ D400
- 500x500
- ⬡ Anti-theft

Load Class	Weight [kg]	Pcs./palette	Black coating	Item-no.
D400	34	40	-	1202892
D400	34	40	x	1202893

# ACO Combipoint System



## total fit

Short, long, wet sludge - all the different shapes can be put together quickly using the Combipoint PP modular system. The logic is the same as the modular design principles used for concrete parts under DIN 4052.

## light

Its light weight is an advantage when installing road drainage. The polypropylene material provides a cost-saving, as it significantly reduces laying time and does not require any heavy lifting equipment.

## bendable

The round bottom part can be twisted around the pipe's axis independently of the upper or centre sections.



## tiltable (lengthwise/sideways)

The push connections for the upper parts can be bent to suit local slopes either lengthwise or side-ways (bend on join of up to 10 %).



## telescopic

Optimal heights for each component by allowing telescoping at each push connection.

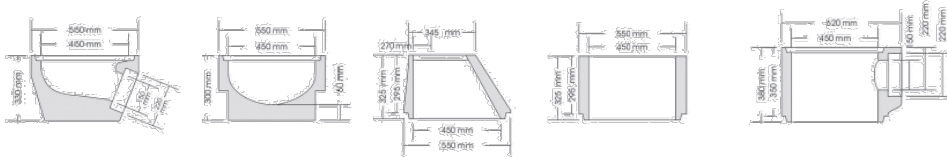


## waterproof

Waterproof up to 0.5 bar as per DIN 4060 thanks to integrated EPDM lip seals.

# The Combipoint PP modular system – programme structure and combination options

Normal DIN 4052 compliant concrete parts



Bottom 1a Weight: 70 kg	Bottom 2a Weight: 86 kg	Cone K 11 Weight: 51 kg	Shaft 5c/d Connecting part 6a/b Weight: 56 kg	Sleeve 3a Weight: 76 kg
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Components Combipoint PP



Item number

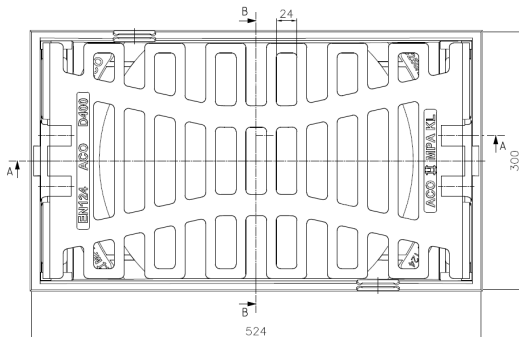
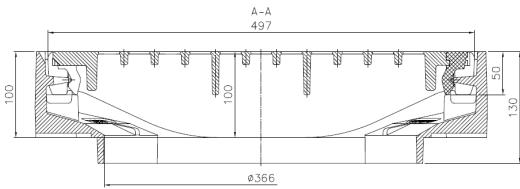
89010	89011	89012	89013	89014
Combipoint PP Bottom 1a Weight: 2,6 kg	Combipoint PP Bottom 2a Weight: 2,5 kg	Combipoint PP Cone K 11 Weight: 2,6 kg	Combipoint PP Connecting part 5b/6a Weight: 2,6 kg	Combipoint PP Connecting part 3 Weight: 2,8 kg



possible drain shapes by combination

	400 x 400			500 x 500		
	short form	long form	wet sludge	short form	long form	wet sludge
consisting of item numbers	89010 89012	89010 89013 89012	89011 89014 89012	89010 89013	89010 89013 89013	89011 89014 89013

# Multitop 300x500 C250/D400 Combipoint



## Product description

### ACO Multitop Gully Top Combipoint

Class C250 / D400 according to DIN EN 124  
**Multitop** grating, with four maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 14 / 20 kg  
 Frame of cast iron (GJL), liftable, height 100 mm, with **cushioning inserts**  
 external dimensions 300 x 524 mm, Intake area 667 cm<sup>2</sup>, total weight approx. 35 / 40 kg

## Product information

### Variations

- Dirt bucket possible acc. DIN 4052-4
- Black hydro-based coating

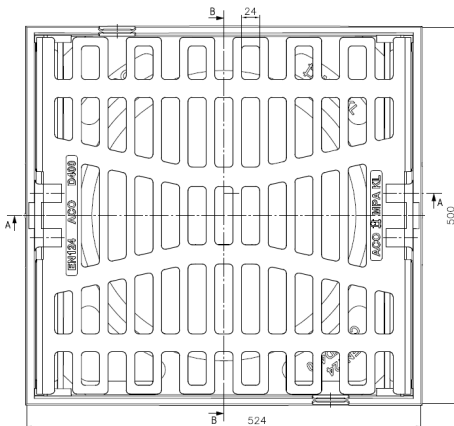
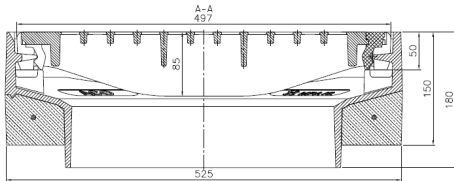
## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Frame circumferential closed with removable drainage during construction period
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

- ✓ EN 124
- ↓ C250 / D400
- 300x500
- ⬡ Anti-theft

Load Class	Weight [kg]	Pcs./pallet	Coating	Item no
C250	35,0	24	-	89111
C250	35,0	24	X	89124
D400	40,0	24	-	89115
D400	40,0	24	X	89126

# Multitop 500x500 C250/D400 Combipoint



## Product description

### ACO Multitop Gully Top Combipoint

Class C250 / D400 according to DIN EN 124  
**Multitop** grating, with four maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 21/ 28 kg  
 BEGU-Frame of cast iron (GJL) with concrete, liftable, height 150 mm, with **cushioning inserts**, external dimensions 500 x 524 mm, Intake area 1.125 cm<sup>2</sup>, total weight approx. 74 / 80 kg

## Product information

### Variations

- Dirt bucket possible acc. DIN 4052-4
- Black hydro-based coating

## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Frame circumferential closed with removable drainage during construction period
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

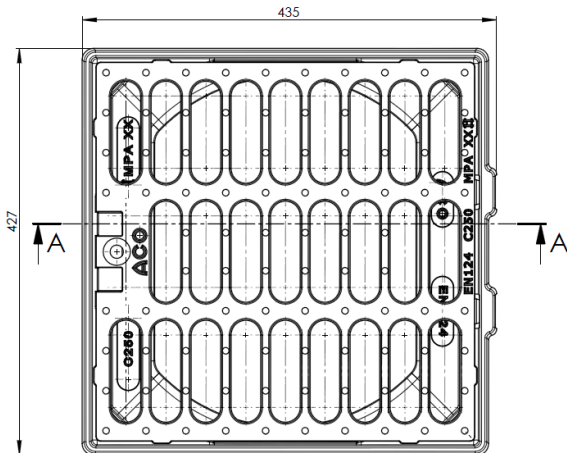
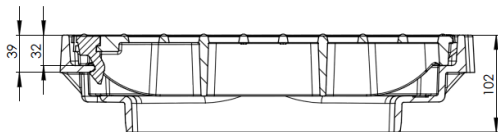
- ✓ EN 124
- ↓ C250 / D400
- 500x500
- ⬡ Anti-theft

Load Class	Weight [kg]	Pcs./pallet	Coating	Item no
C250	74,0	12	-	89113
C250	74,0	12	X	89127
D400	78,0	12	-	89117
D400	78,0	12	X	89121

# HighDrain 400x400 C250 Combipoint



A-A (1:3)



## Product description

### ACO HighDrain Combipoint Gully Top

Class C250 according to DIN EN 124

**HighDrain S** grating, square, with two maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 11 kg

**Combipoint** frame, square, height 100 mm, external dimensions 435x427 mm, max. bearing pressure 3,6 N/mm<sup>2</sup>, Intake area 780 cm<sup>2</sup>, total weight approx. 23 kg

## Product information

### Variations

- Dirt bucket possible acc. DIN 4052-4
- Black hydro-based coating

## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Additional lug segments for a secure installation on the shaft
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

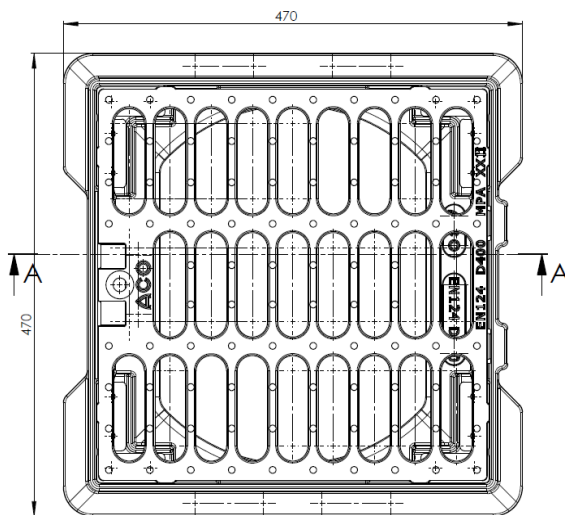
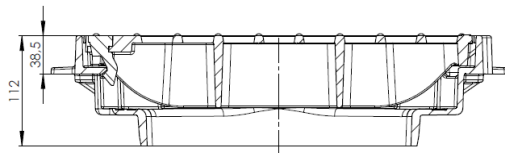
- ✓ EN 124
- ↓ C250
- 400x400
- ⬡ Anti-theft

Load Class	Weight [kg]	Pcs./pallet	Black coating	Item-no.
C250	23	40	-	1203344
C250	23	40	x	1203288

# HighDrain 400x400 D400 Combipoint



A-A (1:3)



## Product description

### ACO HighDrain Combipoint Gully Top

Class D400 according to DIN EN 124

**HighDrain S** grating, square, with two maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 13 kg

**Combipoint** flanged frame, square, height 112 mm,

external dimensions 470x470 mm,

max. bearing pressure 3,6 N/mm<sup>2</sup>, Intake area 780 cm<sup>2</sup>, total weight approx. 26 kg

## Product information

### Variations

- Dirt bucket possible acc. DIN 4052-4
- Black hydro-based coating

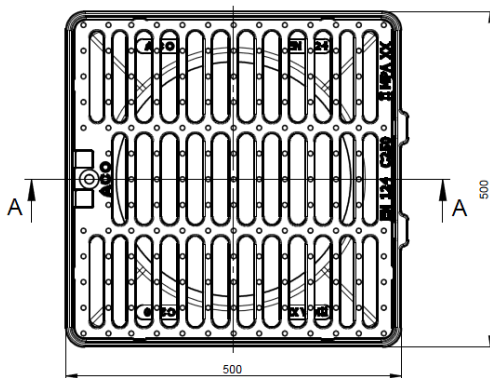
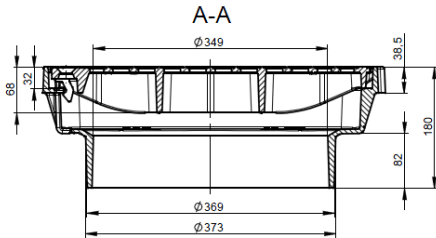
## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Additional lug segments for a secure installation on the shaft
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

- ✓ EN 124
- ↓ D400
- 400x400
- ⬡ Anti-theft

Load Class	Weight [kg]	Pcs./palette	Black coating	Item-no.
D400	26	40	-	1203345
D400	26	40	x	1203289

# HighDrain 500x500 C250 Combipoint



- EN 124
- C250
- 500x500
- Anti-theft

## Product description

**ACO HighDrain Combipoint Gully Top**  
 Class C250 according to DIN EN 124  
**HighDrain S** grating, square, with two maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 16 kg  
**Combipoint** frame, square, height 68 mm, external dimensions 500x500mm, max. bearing pressure 3,6 N/mm<sup>2</sup>, Intake area 920 cm<sup>2</sup>, total weight approx. 36 kg

## Product information

- Variations**
- Dirt bucket possible acc. DIN 4052-4
  - Black hydro-based coating

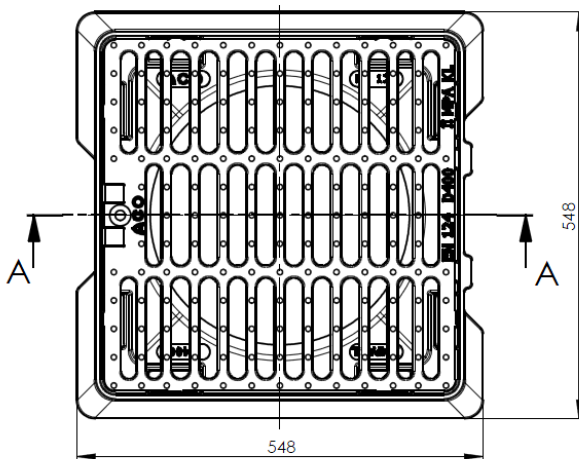
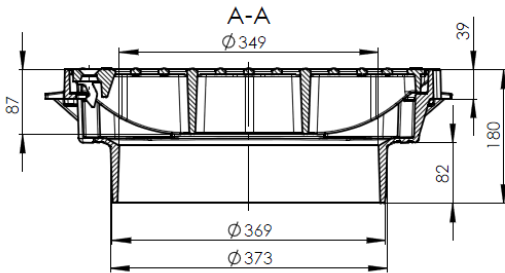
## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

Load Class	Weight [kg]	Pcs./palette	Black coating	Item-no.
C250	36	20	-	1203072
C250	36	20	x	1203073



# HighDrain 500x500 D400 Combipoint



## Product description

**ACO HighDrain Combipoint Gully Top**  
 Class D400 according to DIN EN 124  
**HighDrain S** grating, square, with two maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. 18 kg  
**Combipoint** frame, square, height 87 mm, external dimensions 548x548 mm, max. bearing pressure 3,6 N/mm<sup>2</sup>, Intake area 920 cm<sup>2</sup>, total weight approx. 42 kg

## Product information

- Variations**
- Dirt bucket possible acc. DIN 4052-4
  - Black hydro-based coating

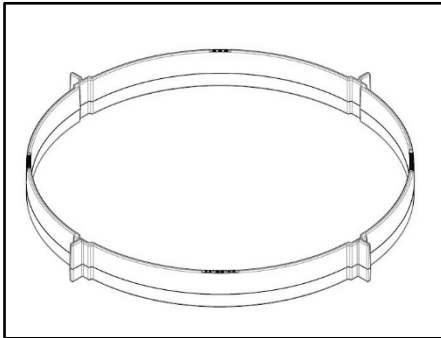
## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

- ✓ EN 124
- ↓ D400
- 500x500
- ⬡ Anti-theft

Load Class	Weight [kg]	Pcs./pal let	Black coating	Item-no.
C250	42	20	-	1203109
C250	42	20	x	1203110

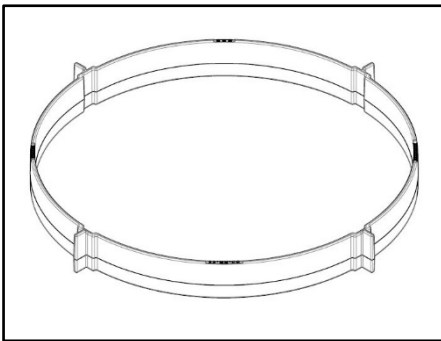
## Accessories



### Adapter ring 80mm

Internal diameter 708mm, 11kg  
To install 140mm Bituplan covers in a height of 160-200

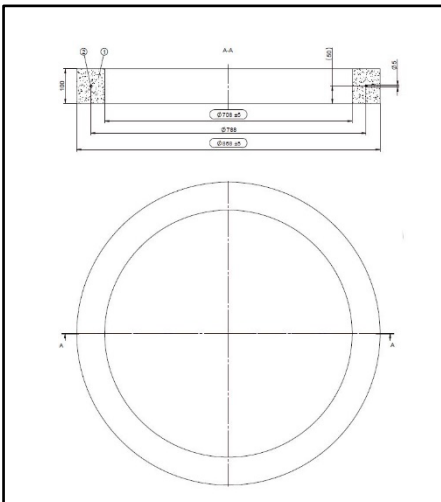
Article 1204755  
Made of cast iron



### Adapter ring 100mm

Internal diameter 708mm, 13kg  
To install 160mm Bituplan covers in a height up to 240

Article 1204754  
Made of cast iron



### Concrete Adapter ring

Internal diameter 708mm

Article 1203746, 48 kg, height 100mm  
Article 1203745, 38 kg, height 80mm

Made of concrete

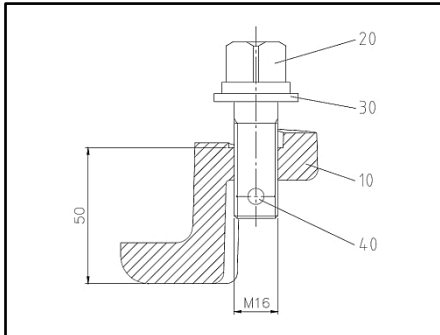


### Installation formwork / shuttering (reusable)

For Bituplan covers  $\varnothing$  600 mm

Article 64476  
Weight 10 kg  
Made of steel

## Accessories

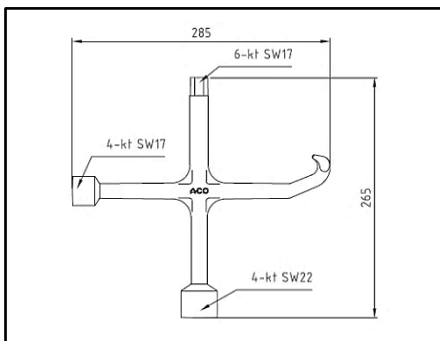


### Anti-theft kit

For Citytop Plus ,Edition Pure', Citytop Plus / P and S

Article 210248

Weight 1,2 kg



### Opening- and lifting tool

Article 85518 / 4143.00.00

Weight 1,3 kg

Made of cast iron



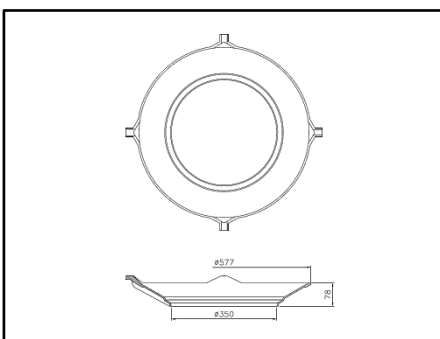
### Opening- and lifting tool

length 600 mm

Article 600643

Weight 1,5 kg

Made of steel



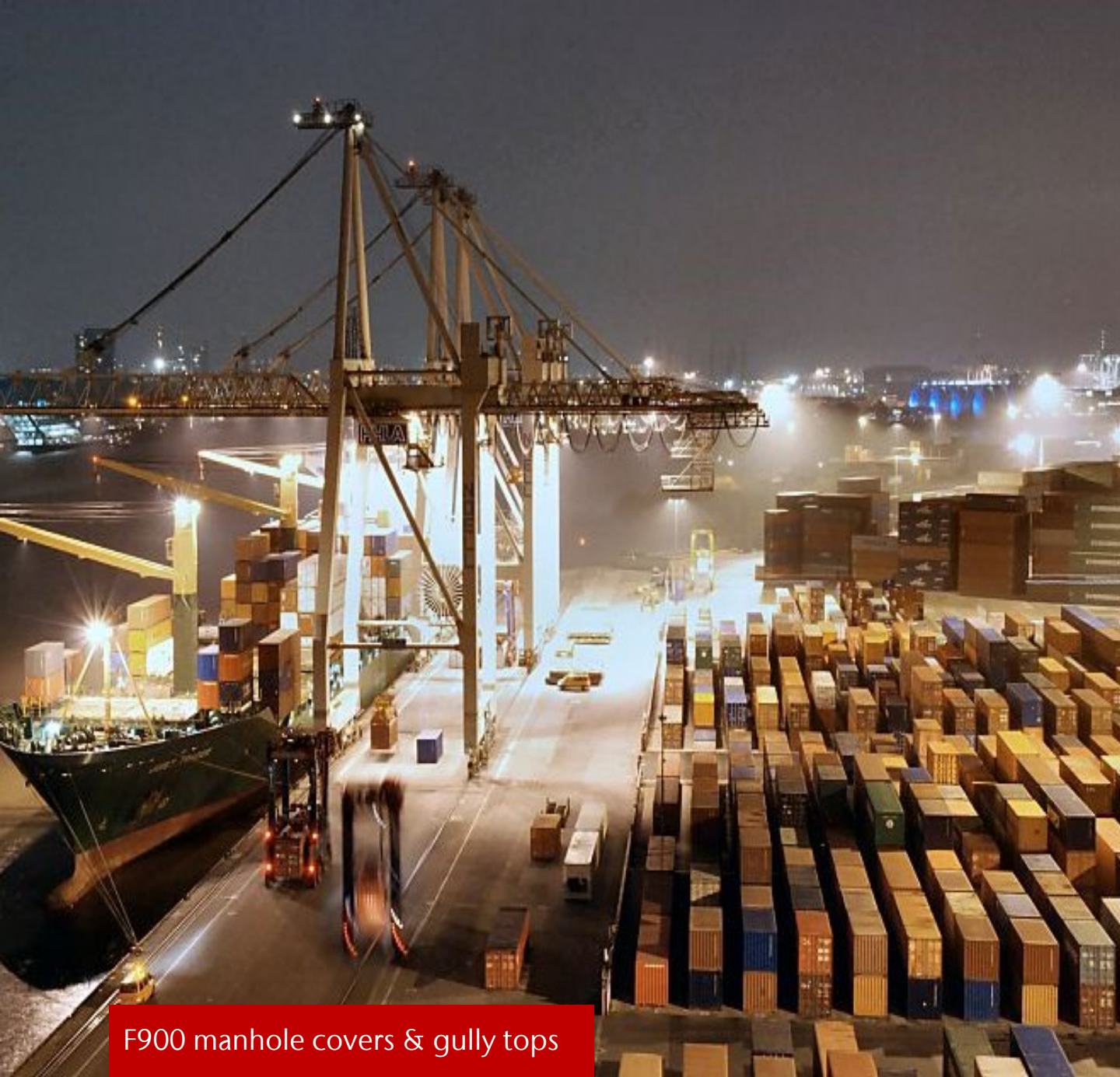
### Funnel with bucket support

For inlet gratings  $\varnothing$  600 mm  
to use buckets acc. to DIN4052

Article 85621 / 4750.00.00

Weight 12 kg

Made of cast iron



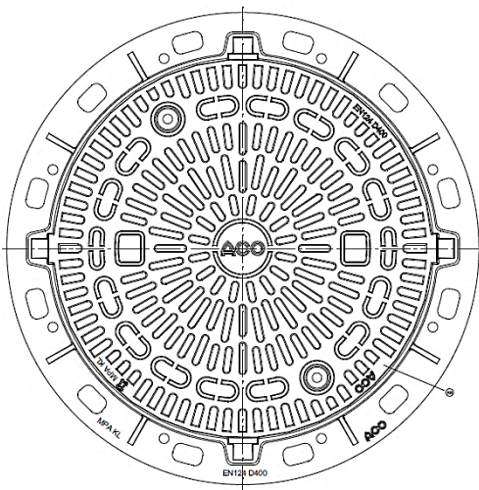
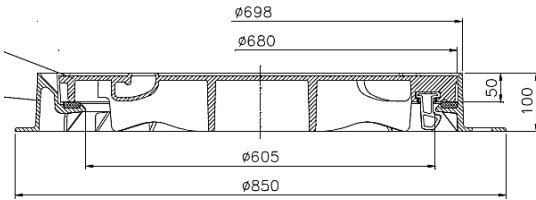
F900 manhole covers & gully tops

Inter Company product information

For internal use only



# CityTop P F900 Fix850



## Product description

**ACO CityTop P manhole cover**  
 Class F900 according to DIN EN 124  
**CityTop P** 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. 57kg  
**Fix** frame, round, height 100 mm, external diameter 850 mm, max. bearing pressure 3,6 N/mm<sup>2</sup>, ventilation cross section 520 cm<sup>2</sup>, total weight approx. 84 kg

## Product information

### Variations

- Logo cover

### Accessories

- Operating tool **600643**

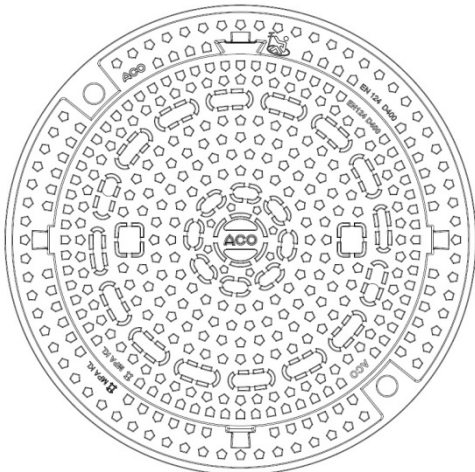
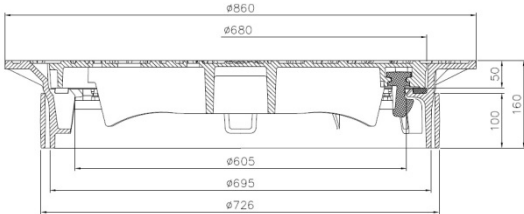
## Advantages

- Safe positioning of the cover due to an additional stabilization groove
- Easy installation also in case of refurbishment with the 100 mm fix frame
- Durable PEWEPREN cushioning insert

- ✓ EN 124
- ↓ F900
- ⊘ 605mm
- ⬡ Anti-theft

Weight [kg]	Pcs / pallet	Ventilation holes	Black coating	Item-no.
84	8	-	-	1204959
84	8	-	X	1204960

# Multitop Bituplan F900



## Product description

### ACO Multitop Bituplan manhole cover

Class F900 according to EN 124

**Multitop** 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. 44/ 47kg

**Bituplan** self-leveling frame, round, height 160 mm, external diameter 860 mm, max. bearing pressure 1,6 N/mm<sup>2</sup>,

**Adapter ring** of cast iron, h100 mm total weight approx. 106 kg

## Product information

### Variations

- Black hydro-based coating
- Logo cover

### Accessories

- Operating tool **600643**
- Installation shuttering **210132**

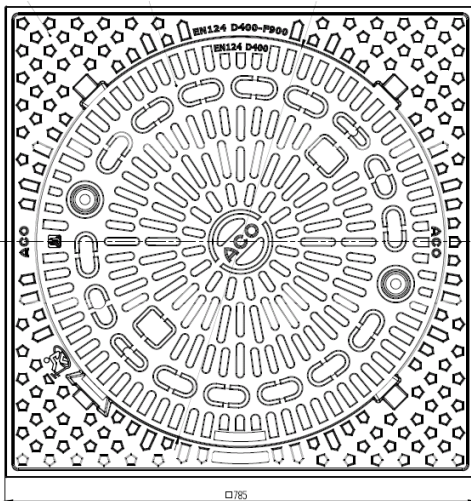
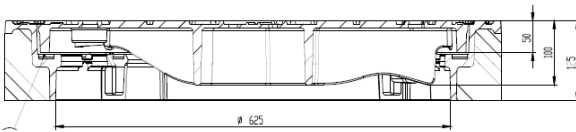
## Advantages

- Self-leveling frame with a max. bearing pressure of 1,6 N/mm<sup>2</sup>
- Safe positioning of the cover due to an additional stabilization groove
- Easy installation also in case of refurbishment with the 160mm Bituplan frame
- Durable PEWEPREN cushioning insert

- ✓ EN 124
- ↓ F900
- ⊘ 605mm
- △ Anti slip

Weight [kg]	Pcs / pallet	Ventilation holes	Black coating	Item-no. with adapter ring
105		-	-	210552
106		X	-	210553

# CityTop P F900 BEGU square



- ✓ EN 124
- ↓ F900
- ⊘ 605mm
- ⬡ Anti-theft

## Product description

**ACO CityTop P manhole cover**  
 Class F900 according to DIN EN 124  
**CityTop P** 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. 57kg  
**Lift** frame, square, height 125 mm, external diameter 785 mm, max. bearing pressure 3,6 N/mm<sup>2</sup>, total weight approx. 180 kg

## Product information

**Variations**

- Logo cover

**Accessories**

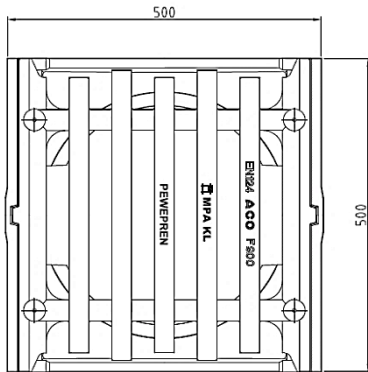
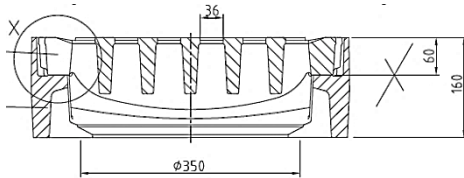
- Operating tool **600643**

## Advantages

- Safe positioning of the cover due to an additional stabilization groove
- Concrete C 35/45 is conforming to the highest classification of exposure conditions with freeze-thaw and deicing resistance
- Durable PEWEPREN cushioning insert

Weight [kg]	Pcs / pallet	Ventilation holes	Black coating	Item-no.
180	8	x	-	N.A.
180	8	-	-	1205239

# ClassicTop gully top F900



- ✓ EN 124
- ↓ F900
- 500x500

## Product description

**ClassicTop Gully Top**  
 Class F900 according to DIN EN 124  
**Grating** made of spheroidal graphite cast iron (GJS), slot width 36 mm, with cushioning inserts weight approx. 58 kg  
**Fame** of cast iron (GJL), liftable, height 160 mm, external dimensions 500 x 500 mm, Intake area 896 cm<sup>2</sup>, total weight approx. 114 kg

## Product information

- Variations**
- dirt bucket possible acc. DIN 4052-4
- Accessories**
- Operating tool 600643
  - Bearing plate 4415.00.00

## Advantages

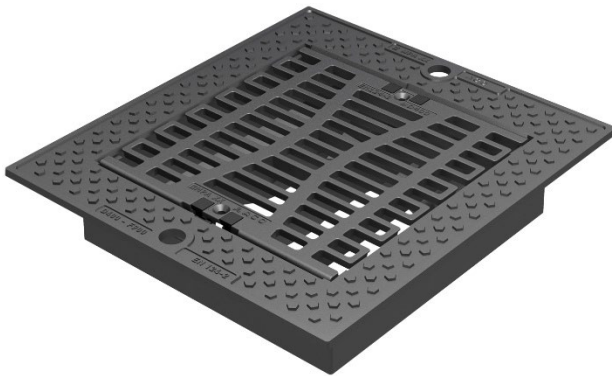
- Full GGG grating with optimized load transmission shaping and high intake capacity
- Frame circumferential closed with removable drainage during construction period
- For optimized load transfer we prefer the usage of a bearing plate made of concrete -> 4415.00.00

Load Class	Weight [kg]	Pcs./pallet	Coating	Item no
F900	114	16	-	4726.10.00



# Multitop Bituplan 500x500 F900

**NEW in 2022**



## Product description

**ACO Multitop Gully Top**  
 Class F900 according to DIN EN 124  
**Multitop** grating, with four maintenance free, screwless, non-integrally cast and traffic-safe securing features made of high-strength plastic, grating made of spheroidal graphite cast iron (GJS), weight approx. xxxxxxxx kg  
 Frame of cast iron (GJL), Biuplan for asphalt embedding, with **cushioning inserts**  
 external dimensions xxxxx mm,  
 Intake area xxxxx cm<sup>2</sup>,  
 total weight approx. xx kg

## Product information

- Variations**
- Dirt bucket possible acc. DIN 4052-4
  - Black hydro-based coating

## Advantages

- Full GGG grating with optimized load transmission shaping and high intake capacity
- Frame circumferential closed with removable drainage during construction period
- Grate is securely kept in the frame
- Special key needed for opening and close with anti-theft kit

- ✓ EN 124
- ↓ D400
- 500x500

Load Class	Weight [kg]	Pcs./pallet	Coating	Item-no.

# Inspection / Gully Top F900 NW425/CO355mm



## Product description

**ACO manhole cover / Gully top**  
 Class F900 according to DIN EN 124  
 Clear opening  $\varnothing$  355 mm, 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. \_\_\_\_kg  
**Bituplan** frame, round,  
 height 200 mm [240mm]

total weight approx. \_\_\_\_ kg

## Product information

### Accessories

- Operating tool 600643

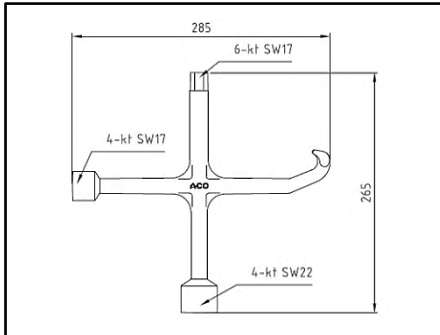
## Advantages

- Durable PEWEPREN cushioning insert
- Black coating

- EN 124
- F900
- 355mm

class	product	Pcs./pallet	Weight [kg]	Item-no.
F900	cover		21	1207548
F900	grating		19	1207692
F900	frame 200		29	1207632
F900	frame 240		--	TBC

## Accessories



### Opening- and lifting tool

Article 85518 / 4143.00.00

Weight 1,3 kg

Made of cast iron



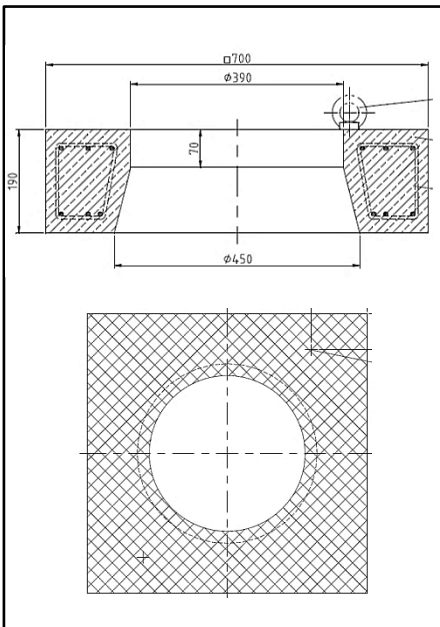
### Opening- and lifting tool

length 600 mm

Article 600643

Weight 1,5 kg

Made of steel



### Bearing plate

For gully top F900

For optimized load transfer

Article 4415.00.00

Weight approx. 170 kg

Made of concrete





Access covers for cable shafts

Inter Company product information

For internal use only



## Trigona load class B125 and D400 with BEGU frame

TRIGONA - the cable duct cover with triangular cover convinces not only by its convenient handling and high functionality.

Optimum design, innovative technology as well as an efficient choice of material ensure convenient opening and closing of the individually removable covers which are rattle proof thanks to the three point contact support.

It was possible to reduce the individual weight of the covers to less than 25 kgs. The unique safety locking mechanism as well as the attractive and ACO specific design of the surface structure meet the most stringent safety requirements.

TRIGONA cable duct covers are capable of being handled by one single person and without any additional lifting tools, thus enabling the network operators to effect tremendous savings of running and maintenance costs.



### Product description

#### TRIGONA Manhole cover for cable ducts

in Class B125 + D 400 according to DIN EN 124

Clear opening 1400 x 700 / 700 x 700 mm, with self-cleaning TRIGONA hinge, with/without special TRIGONA locking mechanism, fully cast surface, mutually secured covers, frame of ductile iron and concrete, height 125 mm, cover of ductile iron

shut safe and 100° opening angle, triangular cover single weight < 25 kgs

- Non-rocking three point seatings
- Self-cleaning hinges
- Shut safe of covers
- Self-arresting covers
- Removable covers
- 100 degree opening angle
- Locking guarantee
- Mutually secured covers
- Single cover weight only 24 kg
- Attractive fully cast surface design
- Slip proof surface structure

✓ **EN 124**

↓ **B125 + D400**

⊘ **700x700 & 700x1400**

## Trigona load class B125 and D400 with BEGU frame



**TRIGONA**  
self-cleaning hinge

**TRIGONA**  
shut safe and self-arresting  
covers with an opening  
angle of 100°



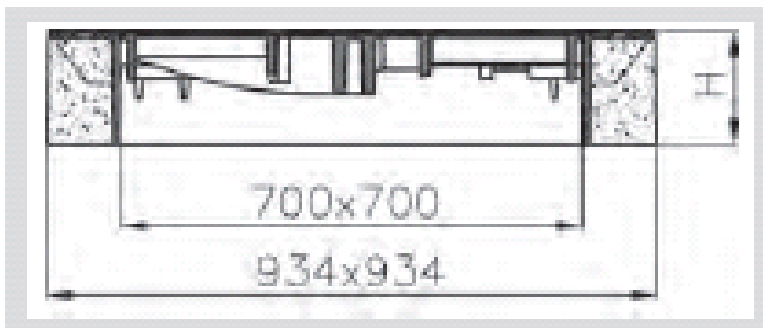
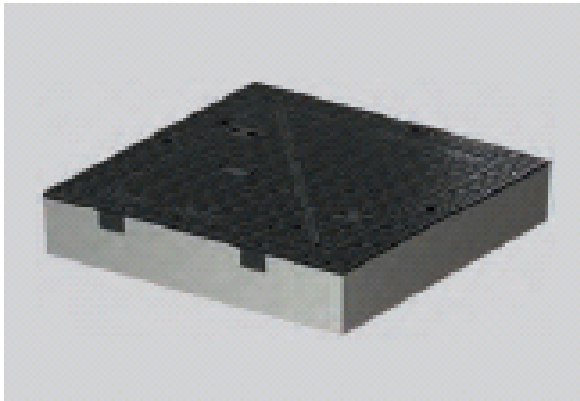
**TRIGONA**  
at 90° covers can be  
taken out



**TRIGONA**  
locked and secured

## Trigona load class B125 and D400 with BEGU frame

Clear opening 700x700 mm

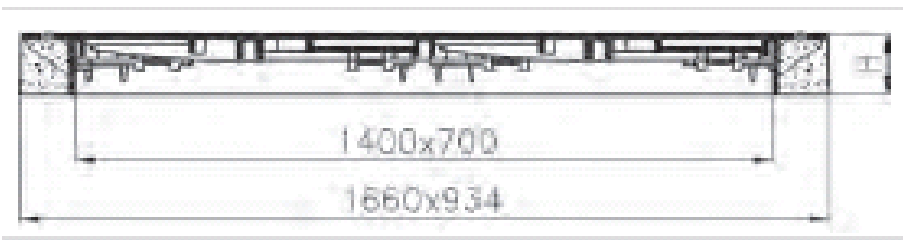
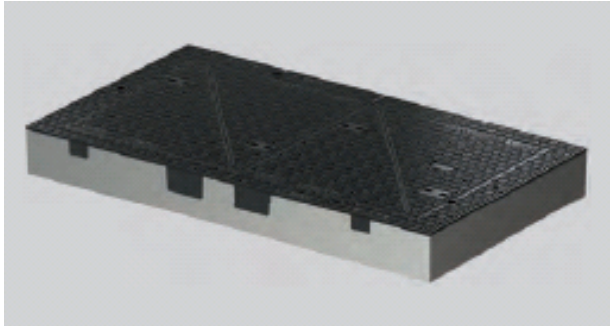


<sup>1</sup> cam lock system

		H (mm)	Pcs per pallet	Weight (kg)	Art.No.
Load class B125	with locking system	125	5	181	600622
	with cam lock system <sup>1</sup>	125	5	181	606325
Load class D400	with locking system	175	5	254	601035
	with cam lock system <sup>1</sup>	175	5	254	606323

## Trigona load class B125 and D400 with BEGU frame

Clear opening 1400x700 mm

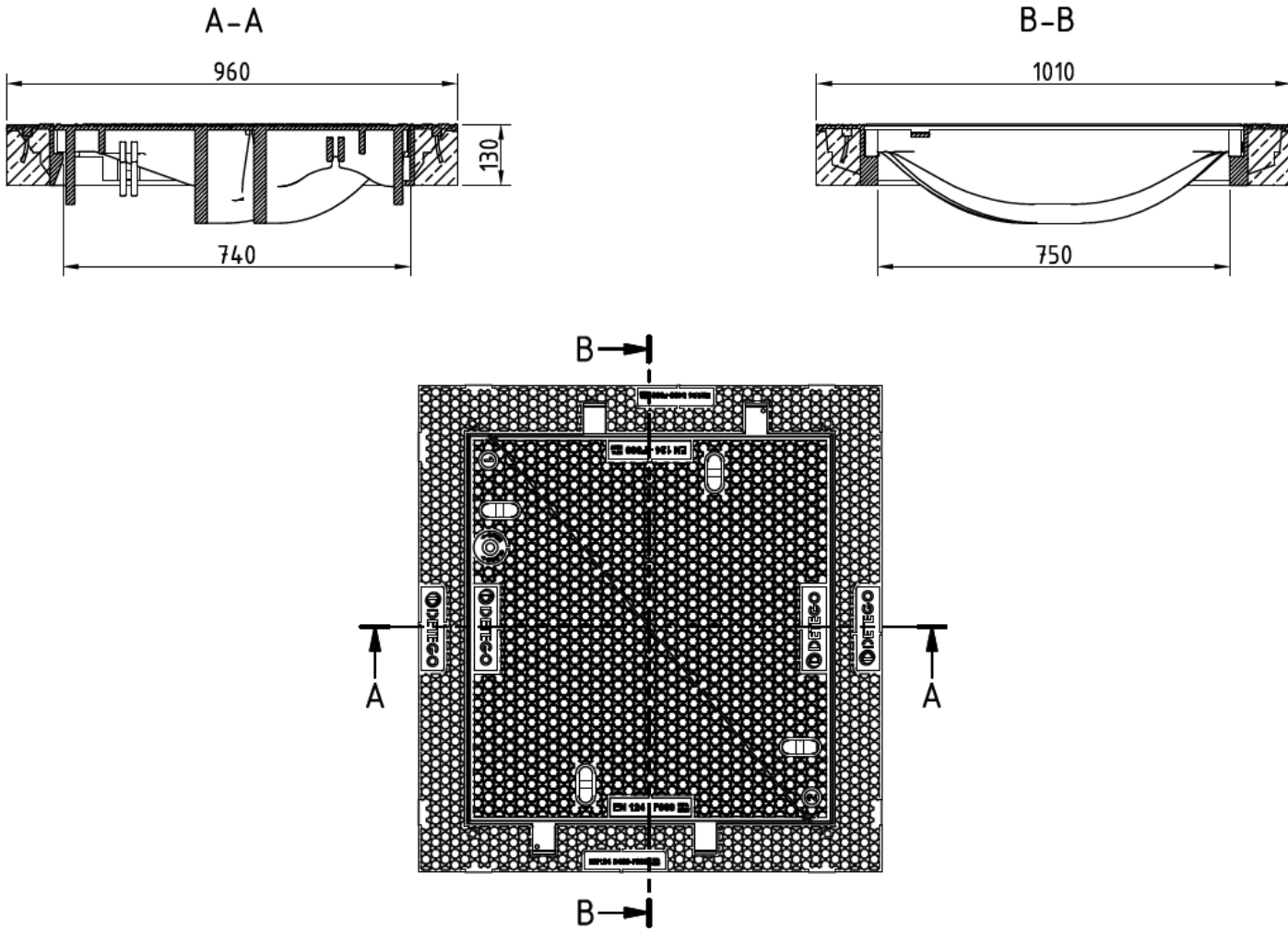


<sup>1</sup> cam lock system

		H (mm)	Pcs per pallet	Weight (kg)	Art.No.
Load class B125	with locking system	125	5	282	600623
	with cam lock system <sup>1</sup>	125	5	282	606326
Load class D400	with locking system	175	3	407	601036
	with cam lock system <sup>1</sup>	175	3	407	606324

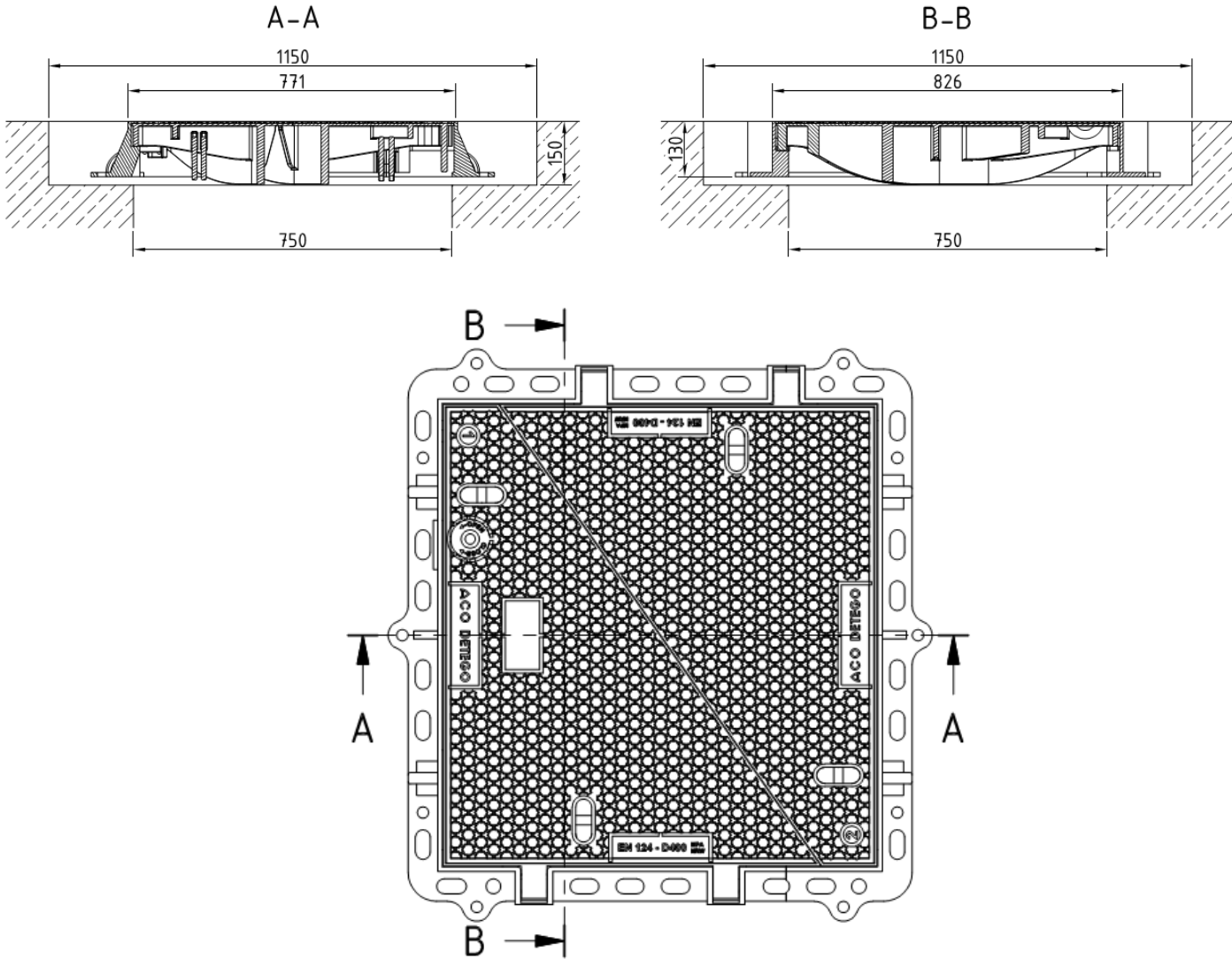


## Detego KSA D400 and F900 with BEGU frame and triangular lids



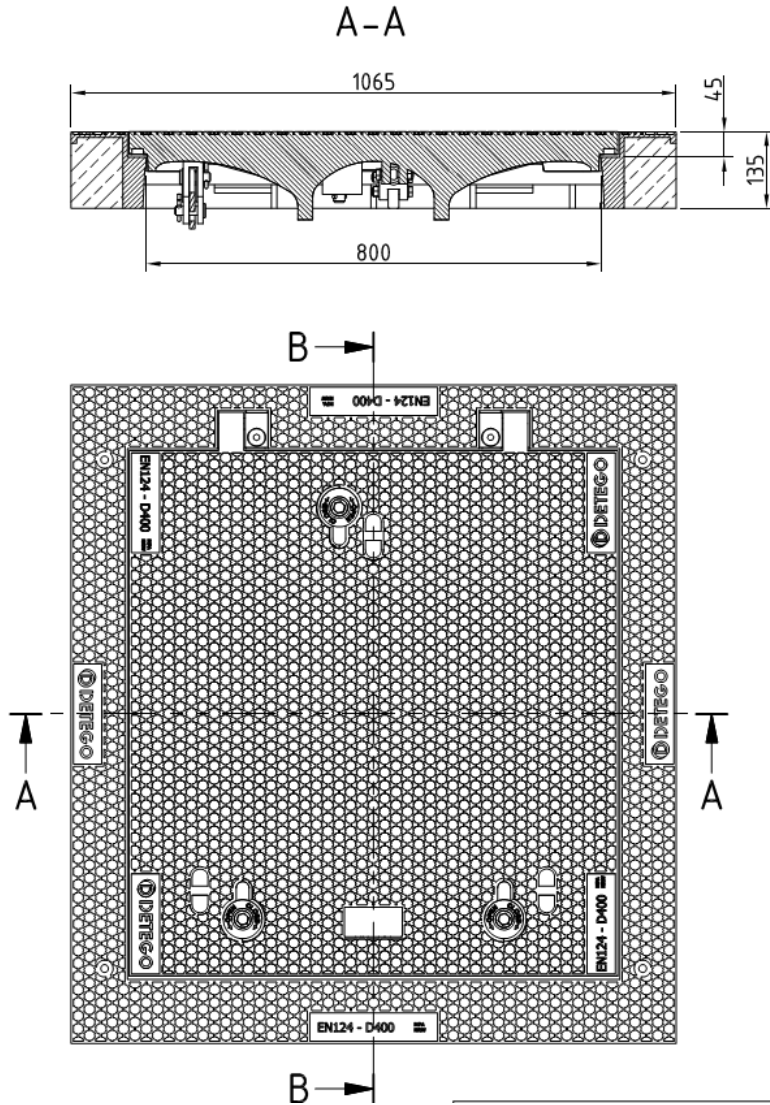
		H (mm)	Clear opening	Weight (kg)	Art.No.
Load class D400	S-KSA-D-075-075-SN-FT	130	750 x 750 mm	310	
	S-KSA-D-075-150-SN-FT	130	750 x 1500 mm	500	
Load class F900	S-KSA-F-075-075-SN-FT	130	750 x 750mm	291	
	S-KSA-F-075-150-SN-FT	130	750 x 1500 mm	450	

## Detego KSA D400 and F900 with flange frame and triangular lids



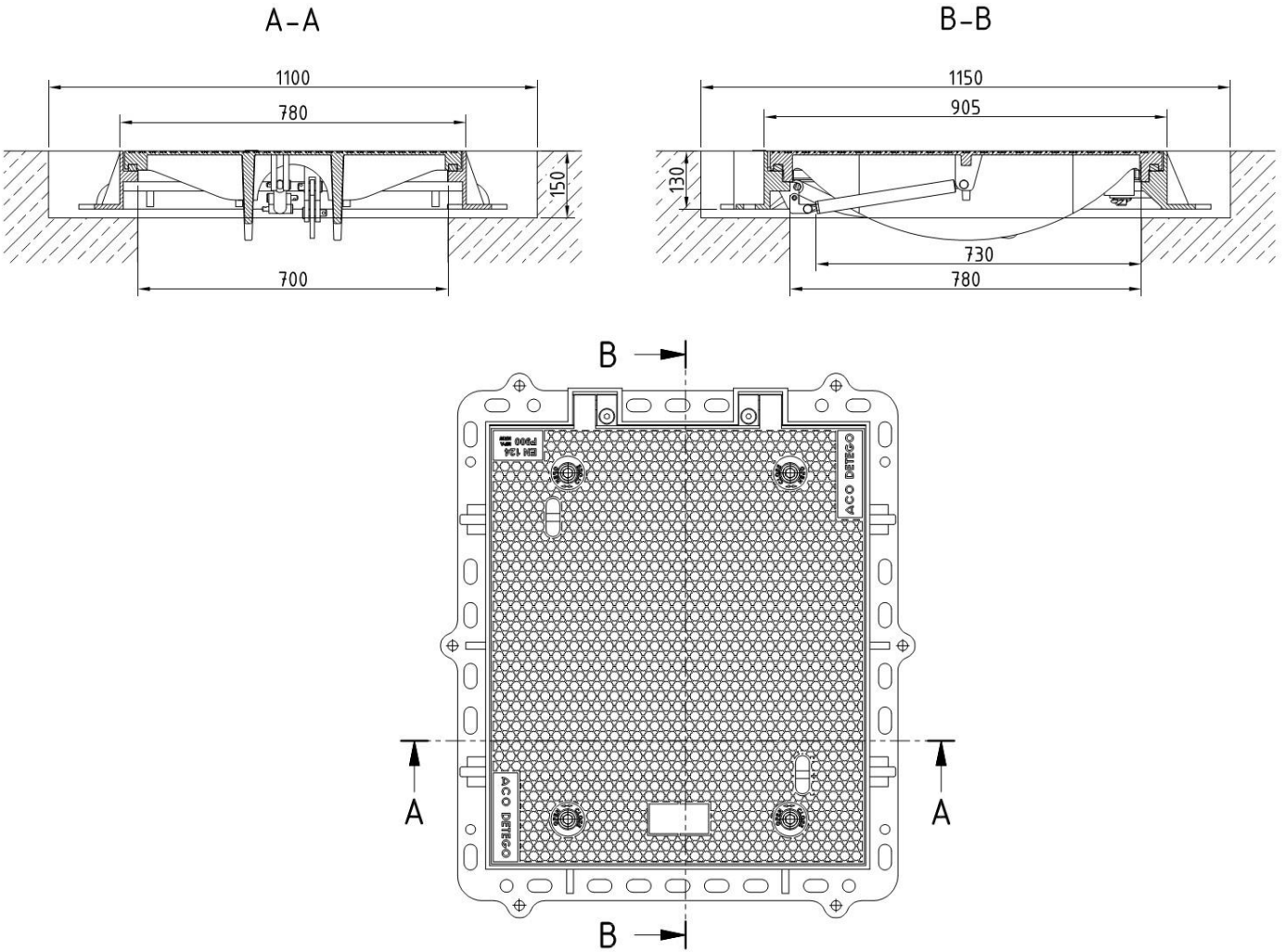
		H (mm)	Clear opening	Weight (kg)	Art.No.
Load class D400	S-KSA-D-075-075	130	750 x 750 mm	180	
	S-KSA-D-075-150	130	750 x 1500 mm	325	
Load class F900	S-KSA-F-075-075	130	750 x 750mm	216	
	S-KSA-F-075-150	130	750 x 1500 mm	407	

# Detego KSA D400 with BEGU frame, rectangular lid, with opening aid, surface-waterproof



		H (mm)	Clear opening	Weight (kg)	Art.No.
Load class D400	S-KSA-D-080-080-TW-SN-FT	135	800 x 800 mm	380	
	S-KSA-D-100-100-TW-SN-FT	135	1000 x 1000 mm	440	

## Detego KSA D400 and F900 with flange frame, rectangular lid, with opening aid, surface-waterproof



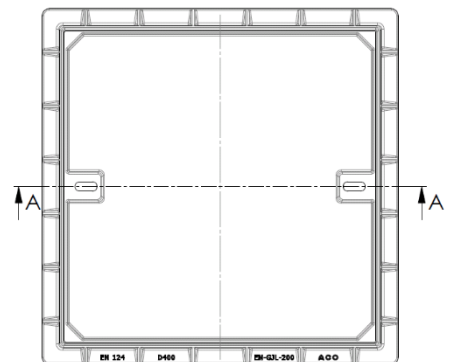
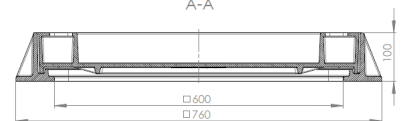
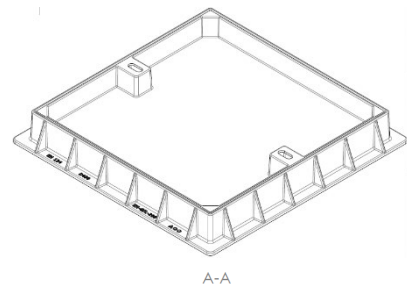
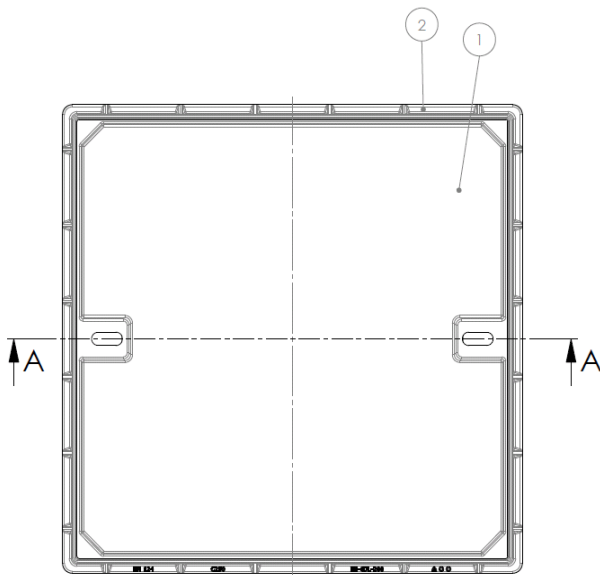
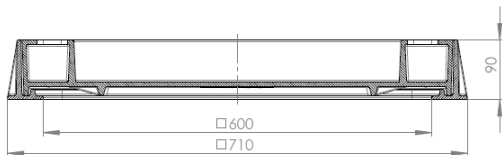
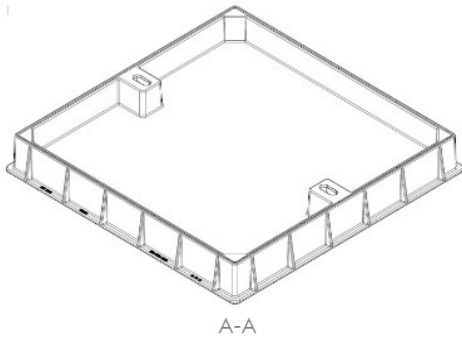
		H (mm)	Clear opening	Weight (kg)	Art.No.
Load class D400	S-KSA-D-075-070-TW	130	750 x 700 mm	198	
	S-KSA-D-075-145-TW	130	750 x 1450 mm	405	
Load class F900	S-KSA-F-075-070-TW	130	750 x 700mm	198	
	S-KSA-F-075-145-TW	130	750 x 1450 mm	405	

## Citytop Plus Inspection cover 315 and 500 D400

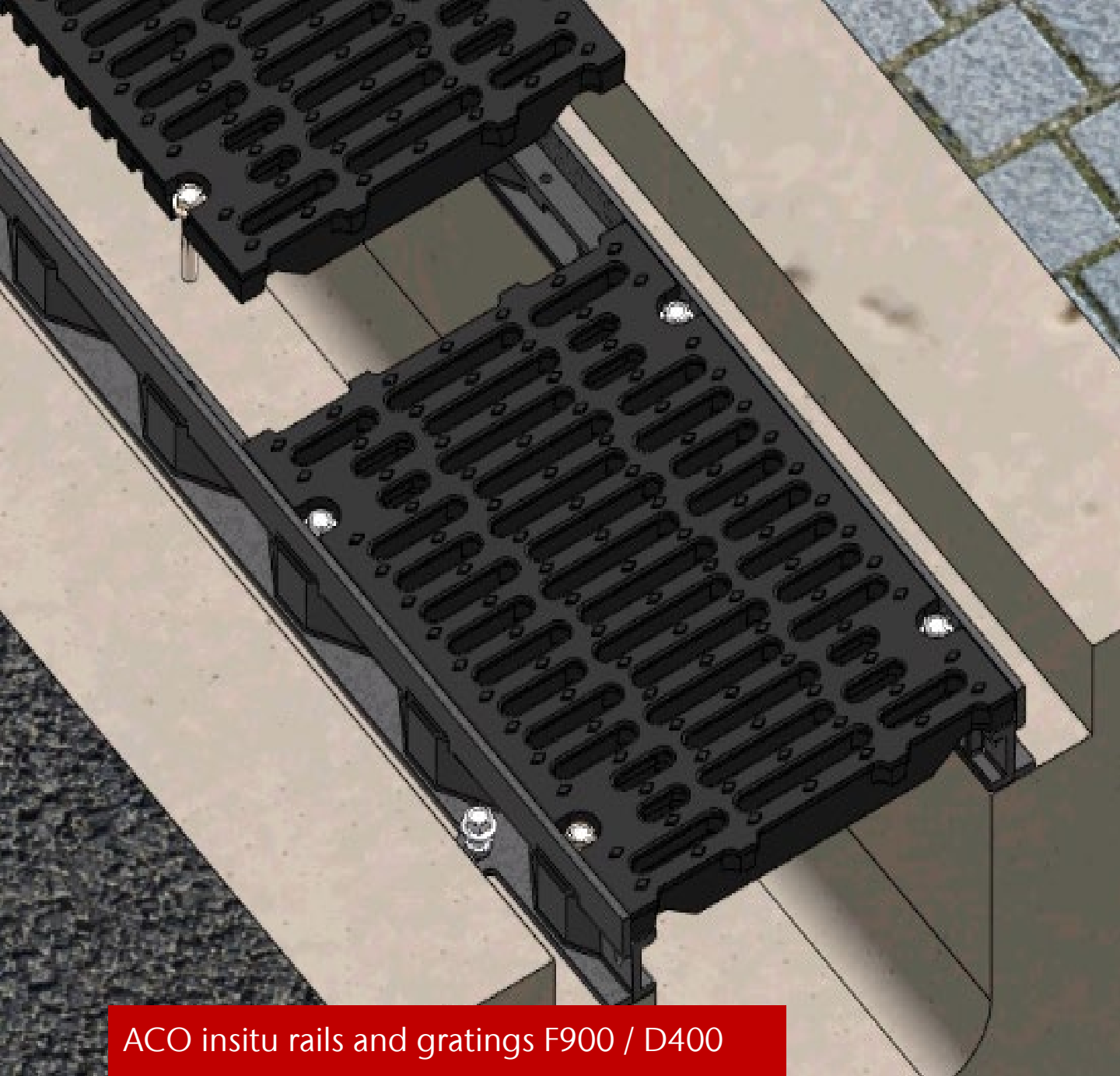
Bituplan frame: skirt to put over plastic pipes

	Cover	
Ø 315 mm		
Article	1207114	1200207 + 1200219
Ø 500 mm		
Article	1207108	

Infill Cover Load Class B125 / C250 / 400kN



Art.no	CO	OD	H	Black	Load class	weight
1207653	600x600	710x710	90	x	B125	52 kg
1203876	600x600	710x710	90	x	C250	52 kg
1203879	600x600	760x760	100	x	400kN	



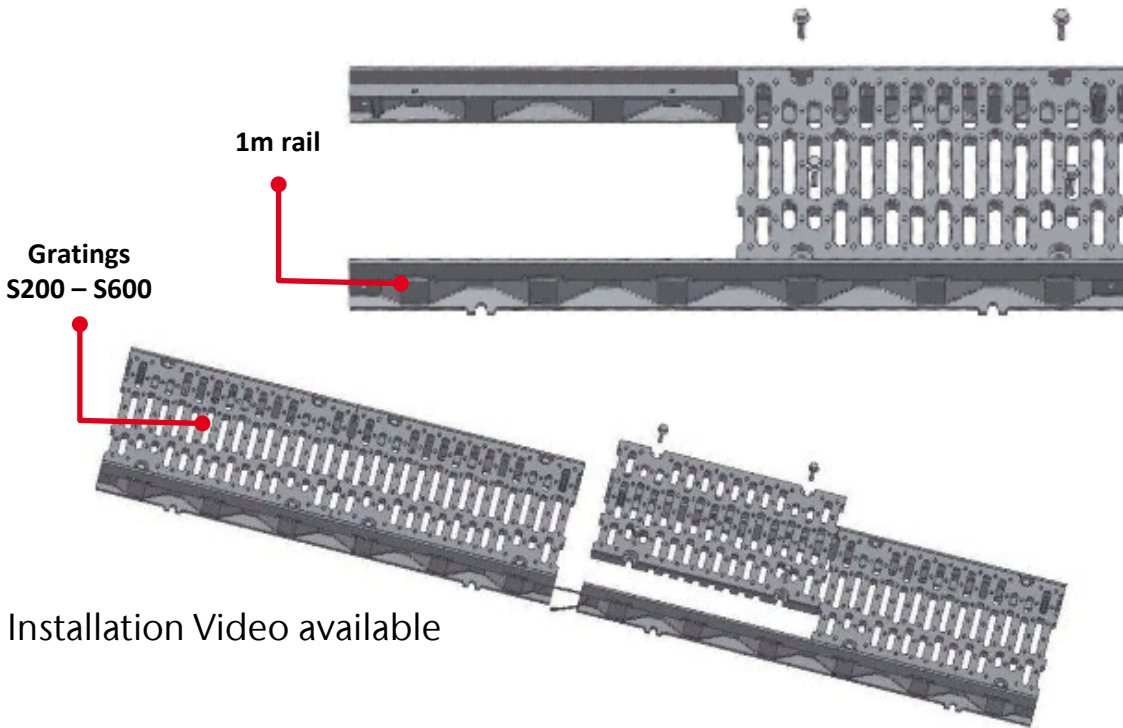
ACO insitu rails and gratings F900 / D400

Inter Company product information

For internal use only



## In Situ S Grating and Rail



Installation Video available

Part-No.	Description	weight(kg)	pcs./pallet
06846	S200 D400 Grating	14,3 kg	70
01593	S200 F900 Grating	14,9 kg	70
03673	S300 D400 Grating	19,0 kg	70
11422	S300 F900 Gussabdeckung (solid)	27,1 kg	40
69422	S300 F900 Grating weight optimized	24,5 kg	40
02639	S300 F900 Grating	33,8 kg	40
66583	S400 D400 Grating	28,2 kg	40
66584	S400 E600 Gussabdeckung (solid)	31,2 kg	40
68018	S400 F900 Grating	37,0 kg	40
66581	S500 D400 Grating	41,0 kg	24
66582	S500 E600 Gussabdeckung (solid)	44,0 kg	24
67939	S500 F900 Grating	60,0 kg	24
<b>1203434</b>	<b>S600 D400 Grating</b>	50,4 kg	16
<b>1203436</b>	<b>S600 F900 Grating</b>	68,7 kg	10
607468	Rail 1m for in situ grating	7,2 kg	100
1204212	Screw set to fix the grating with the rail	-	-





ACO Technical Marketing

One load class D400 – different requirements and costs


For internal use only



# How to choose the right product? (1)


**As per EN 124 all these areas are load class D400!**

**Highway**




> 29.000 vehicles per day  
~30% truck share

**Residential area**




< 1.000 vehicles per day  
< 2% truck share

**Industrial area**



> 3.000 vehicles per day  
~80% truck share

**Commercial area**



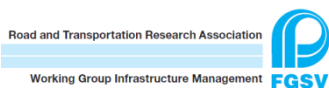
> 4.000 vehicles per day  
~5% truck share

## Load class D400

## How are these areas classified?

The german guideline for standardization of superstructures (**RStO**) contains a classification of roads depending on the different amount of 10-t axle transmissions.

Using this model it's possible to separate the areas of application for the cast iron portfolio of **ACO Passavant Detego**.

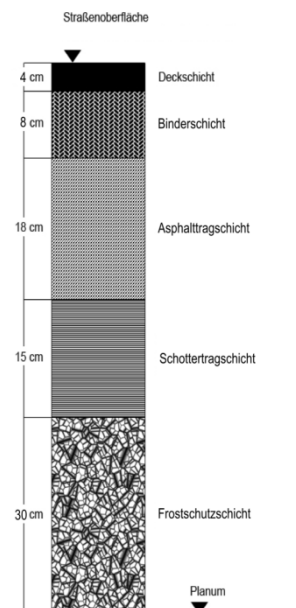


Guidelines for the standardisation of pavement structures of traffic areas

RStO 12

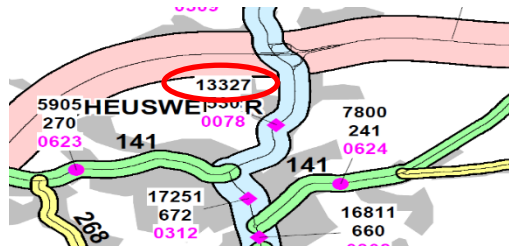
Edition 2012  
Translation 2015

Million of equivalent 10-t axle transmissions	>32	BK100
	<32	BK32
	<10	BK10
	<3.2	BK3.2
	<1.8	BK1.8
	<1.0	BK1.0
	<0.3	BK0.3



# How to choose the right product? (2)

What is the traffic load ?



$$1 \times \text{Truck} = 67.667 \times \text{Car}$$

**1 truck has the same impact than 68.000 cars !**

(You will find a detail calculation in Chapter „Compendium“)

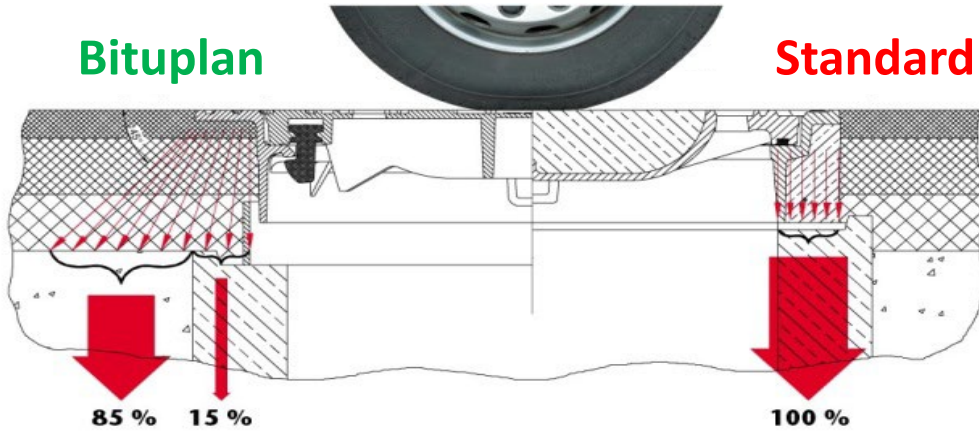
**Right load class = road construction**

Line	Load class	BK100	BK32	BK10	BK3.2	BK1.8	BK1.0	BK0.3
	B [million of ESALs]	> 32	> 10 – 32	> 3.2 – 10	> 1.8 – 3.2	> 1.0 – 1.8	> 0.3 – 1.0	≤ 0.3
	Thickness of frost resistant pavement structure <sup>1)</sup>	55 65 75 85	55 65 75 85	55 65 75 85	45 55 65 75	45 55 65 75	45 55 65 75	35 45 55 65
1	Asphalt base course on frost blanket course							
	Asphalt surface course	12	12	12	10	4	4	4
	Asphalt base course	22	18	14	12	16	14	10
	Frost blanket course	45	45	45	45	45	45	45
Thickness of frost blanket course	– 31 <sup>2)</sup> 41 51	25 <sup>3)</sup> 35 45 55	29 <sup>3)</sup> 39 49 59	– 33 <sup>2)</sup> 43 53	25 <sup>3)</sup> 35 45 55	27 37 47 57	21 31 41 51	
		<b>heavy</b>		<b>mid</b>		<b>low</b>		

**ACO Range Solution**

# How to choose the right product? (3)

## How to choose the right frame?



Less load into the concrete shaft:



### The Bituplan frame

All time equivalent conditions between the frame and the surrounding asphalt is the perfect definition for the ACO Passavant Detego Bituplan frame. In respect of increased traffic volumes and the demand after a high durability, Bituplan is always the right solution.



### The Lift frame

The combination of cast iron and concrete is a long-time proven solution in the field of standard installations of manhole covers. The concrete used for the frame corresponds to compressive strength class C 35/45 is conforming to the highest classification of exposure conditions with freeze-thaw and de-icing resistance.



### The fix frame

A single frame that fits to the most of the given conditions in infrastructure installations is the fix frame. Not only mortared, but additionally fixed onto the top of the manhole shaft is this frame the most taken solution for urban areas.

# How to choose the right product? (4)

## How to choose the right cover?

Good

### CityTop ONE S

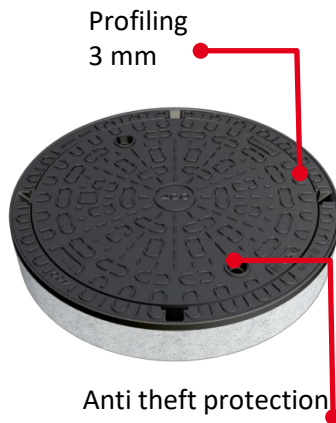
- light cover weight 31kg
- cushioning insert
- Locking plastic
- Hinge
- Weight 52kg



Better

### CityTop S

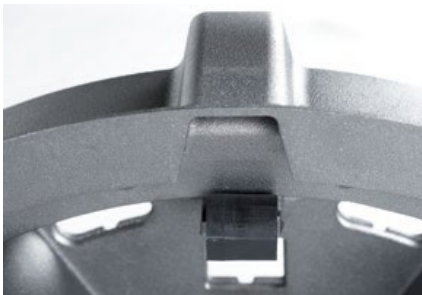
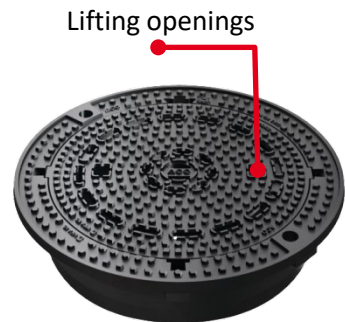
- Middle weight cover 36/41 kg
- Robust SBR cushioning insert
- Option: Anti theft protection



Best

### CityTop P Citytop HR Multitop

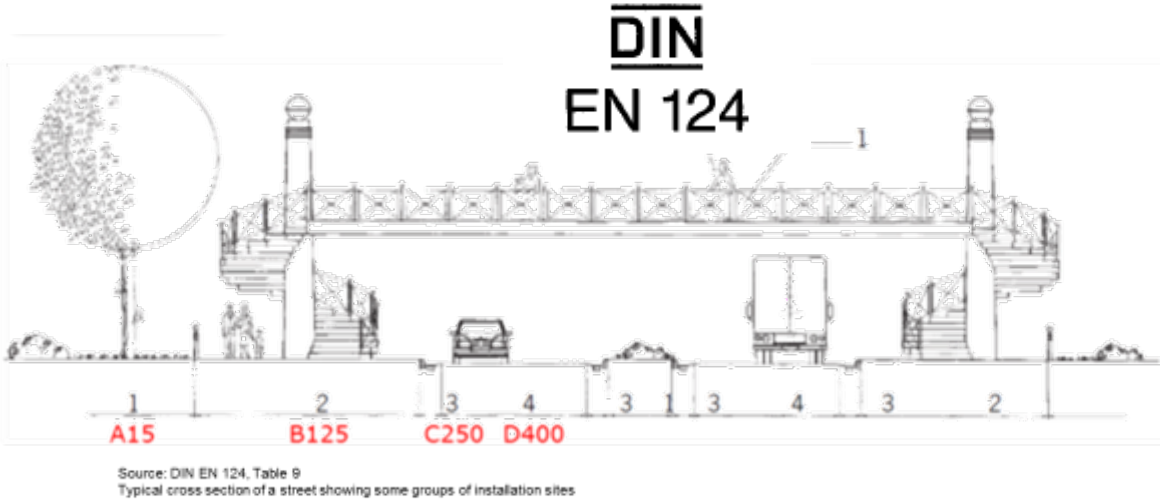
- Heavy weight cover 40-40-47kg
- Robust SBR cushioning insert exchangeable
- Long lifetime under high traffic loads
- Different frame versions



CityTop S, CityTop P and Multitop covers are secured within the frame with locking devices to avoid ejection and/or inappropriate movements. The screwless and exchangeable blocking 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.

The Citytop S and Citytop P will be replaced by a new Citytop PLUS series during the year 2021.

# 1 Separation of Load Classes



- EN 124 is dividing traffic areas into six different groups [load classes], depending on the max. expected vertical load [e.g. 400kN].
- Cast iron products for drainage and canalization are designed in order to withstand the above mentioned vertical loads in conformity with EN 124.
- Motorways with a high traffic volume are load class D400, industrial access road residential areas with low truck traffic are load class D400 ...

**All these areas are load class D400 – no differences?**

**Highway**

> 29.000 vehicles per day  
~30% truck share

**Residential area**

< 1.000 vehicles per day  
< 2% truck share

**Industrial area**

> 3.000 vehicles per day  
~80% truck share

**Commercial area**

> 4.000 vehicles per day  
~5% truck share

Load  
Class  
D400

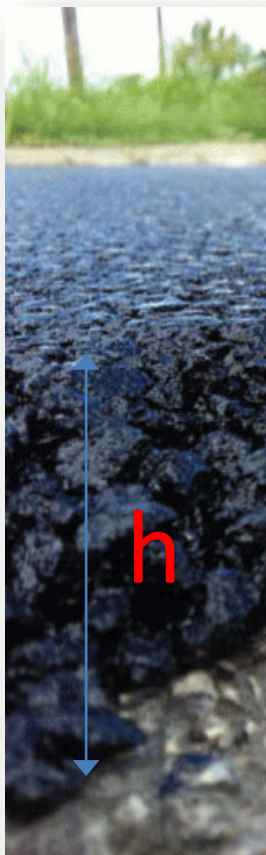
## 2 Classification is needed



- In the past manhole covers we're casted with a high factor of safety, due to the lower price of cast iron, the development stage of cast iron, machinery etc.



- Now, there's a high influence of low-cost products entering the markets. These items are mainly designed with a lower factor of safety = lower durability!



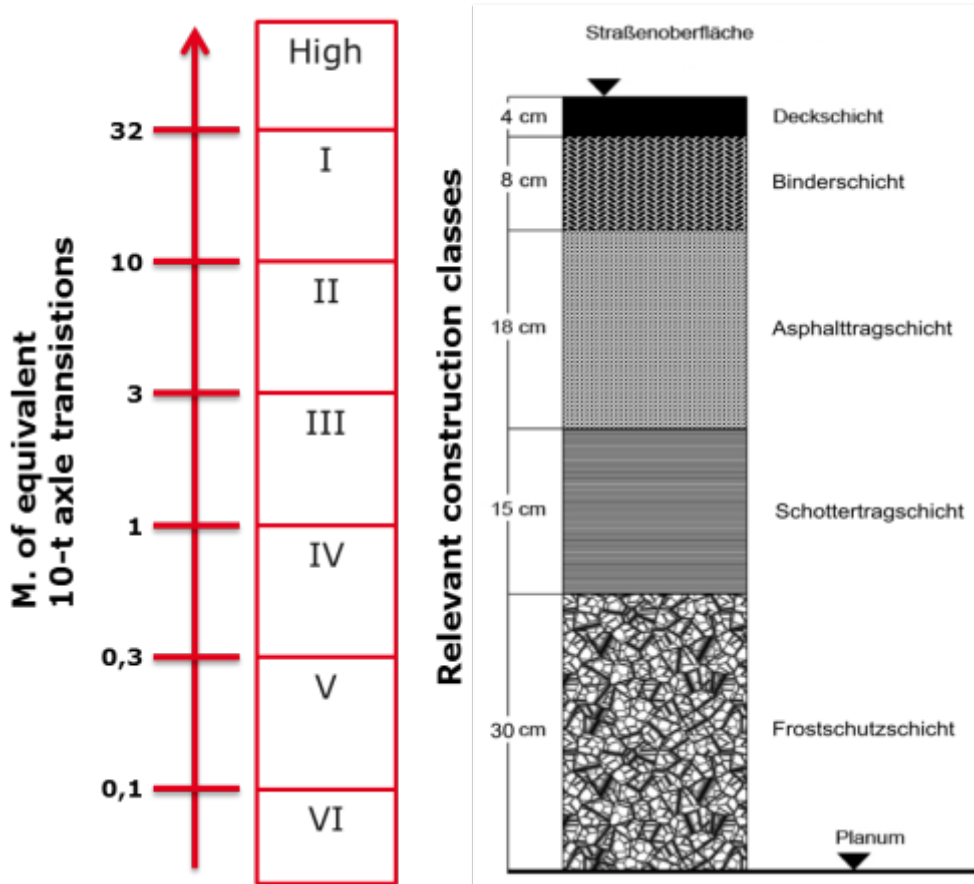
- Combining the facts of a to strong generalization of traffic areas with a highly diversified emergence of vehicle types and traffic volumes
- And the necessity to offer in different price levels according to the area of application
- ACO Passavant Detego will classify the cast iron range after a given and scientifically proven model.
- The German guideline for the standardization of superstructures (RStO) contains a classification of roads depending on the different amount of 10-t axle transitions.
- Using this model it's possible to separate the areas of application for the cast iron portfolio of ACO Passavant Detego.

Richtlinien  
für die Standardisierung  
des Oberbaus  
von Verkehrsflächen

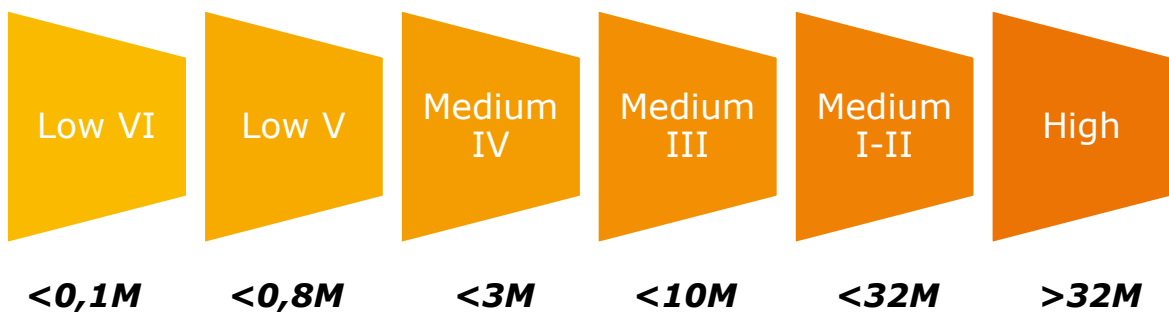
R 1

RStO 12

### 3 Classification of Roads



Each of the below given construction classes represents a specific number of millions of max. 10-t axle transitions:

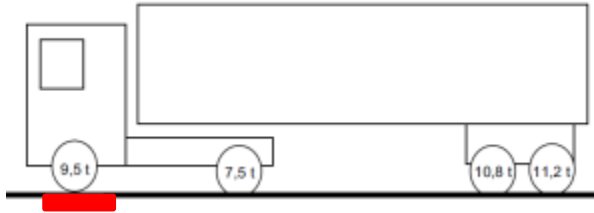


This number represents the 10-t axle transitions until the period of lifetime of the road in the most frequented traffic lane is achieved.



## 4 Loads from Traffic

A truck, total weight of 39 tons, has approxi. following distrubution of mass:

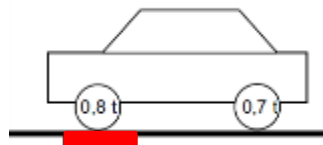


Within the calculation of the loads from heavy trucks, the values are calculated in the 4<sup>th</sup> potency because trogh measurements it was found out, that 10.000 x 1-t axle load will have the same effects of damage than 1 x 10-t axle load.

$$\left(\frac{9,5}{10}\right)^4 + \left(\frac{7,5}{10}\right)^4 + \left(\frac{10,8}{10}\right)^4 + \left(\frac{11,2}{10}\right)^4 = 0,81 + 0,32 + 1,36 + 1,57 = 4,06$$

10-ton reference load

So if the heavy truck rolls over a manhole cover, this passage represents 4,06 equivalent 10t passages. When a car with a total weight of 1,5 tons rolls over the same manhole cover, the number of 10-t equivalent axle passages could be also easily calculated:



manhole cover



$$\left(\frac{0,8}{10}\right)^4 + \left(\frac{0,7}{10}\right)^4 = 0,00004 + 0,00002 = 0,00006$$

Related to the example with the truck the relation between heavy load trucks and cars could be calculated:

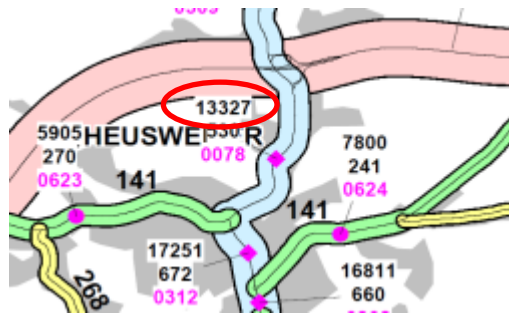
$$4,06 / 0,00006 = 67.667$$

So finally we can say, that 4,06 equivalent 10-ton axle passages of a 4 axle truck represent 67.667 10-ton equivalent axle passages of a car:

$$1 \times \text{Truck} = 67.667 \times \text{Car}$$

## 5 How to calculate which cover I really need? (1)

An Expressway with a given amount of max. 13.327 vehicles per day, the equivalent number of 10t axles should be calculated.



The share of heavy load **truck traffic** was estimated with max. **30%**, so the rest will be cars with a **70%** share.

At first, we take the 10t axle numbers which were already calculated within the 1st example:

$$\text{Trucks: } \left(\frac{9,5}{10}\right)^4 + \left(\frac{7,5}{10}\right)^4 + \left(\frac{10,8}{10}\right)^4 + \left(\frac{11,2}{10}\right)^4 = 4,06$$

$$\text{Cars: } \left(\frac{0,8}{10}\right)^4 + \left(\frac{0,7}{10}\right)^4 = 0,00006$$

Now the average 10t frequency could be calculated:

$$\text{Trucks: } 4,06 * 13.327 * 0,3 = 16.232$$

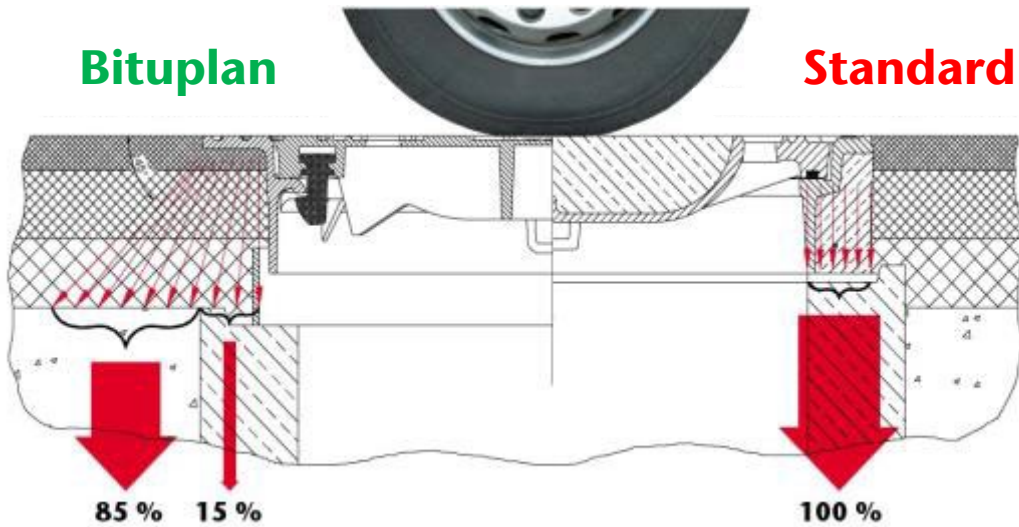
$$\text{Cars: } 6 * 10^{-5} * 13.327 * 0,7 = 0,56$$



Installation guide

manhole covers, gully tops

## Advantage of Bituplan



Less load into the concrete shaft !

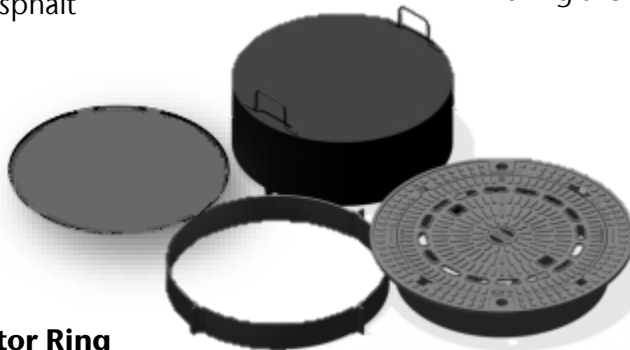
## Installation equipment

### Steel Plate

To cover the manhole during the asphalt installation

### Installation Shuttering

Keeps the interior shaft free from bituminous material during the installation



### Adaptor Ring

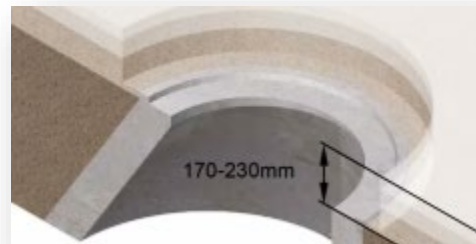
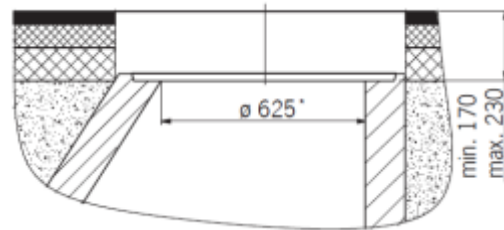
The interface between shaft and the bituplan self-leveling frame

### Bituplan Frame + Cover

The long-lifetime self leveling frame + CityTop cover

## Installation of manhole cover building a new road

- 1.1 By means of common adjustment rings, bring upper edge of the shaft to the required installation height for the bituplan manhole cover, i.e. 170 to 230 mm below upper edge of the final road level.

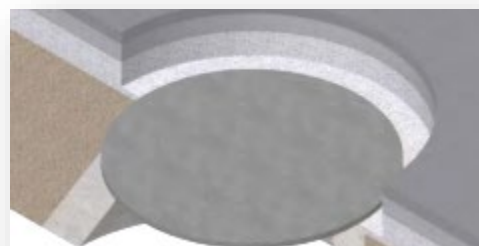
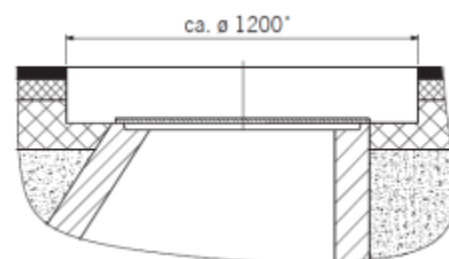


Steel plate

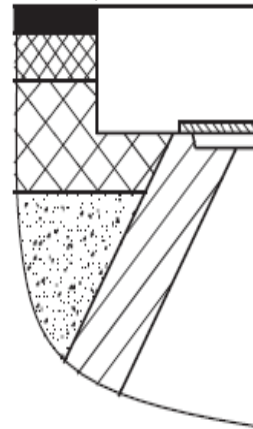
Carrier layer



- 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.



- Covering layer**
  - 40 mm
- Binder layer**
  - 40 to 80 mm
- Carrier layer**
  - 140 to 220 mm



Carrier layer



Binder layer



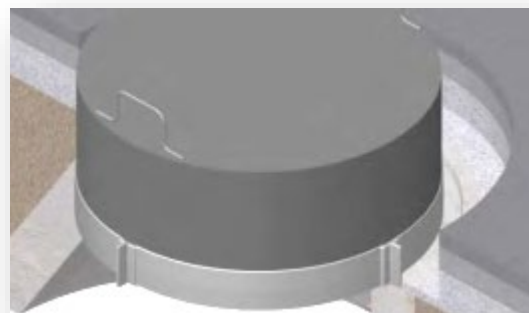
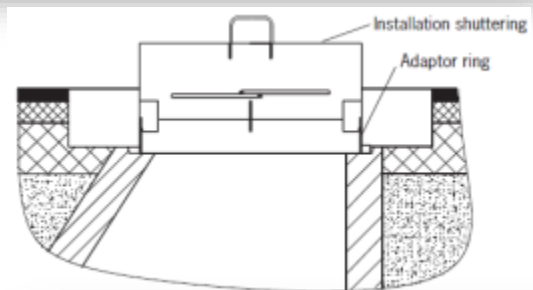
Looking for the manhole cover

Covering layer

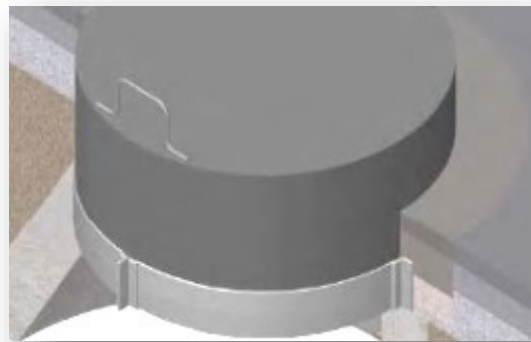
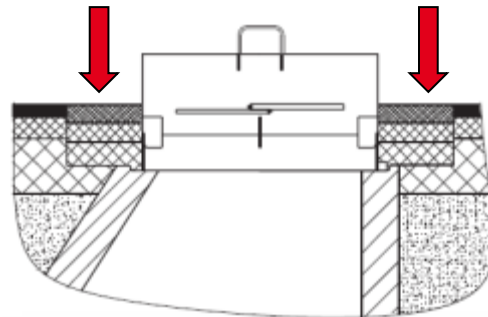


1.8 Fit the adaptor ring to the shaft neck.

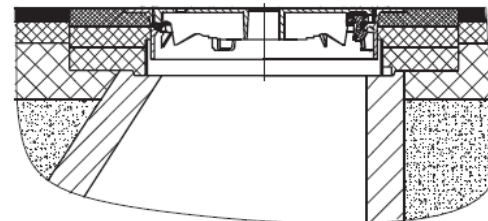
1.9 Insert the installation shuttering in the adaptor ring.



- 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. When inserting the manhole cover it's recommended to underpin the flange with some hot asphalt in order to improve the adhesion between the flange and the asphalt surface

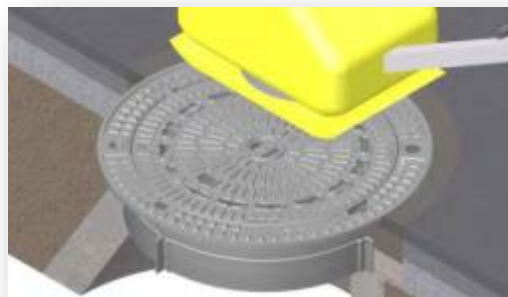




Underpin the flange with hot asphalt



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.





## 4 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:

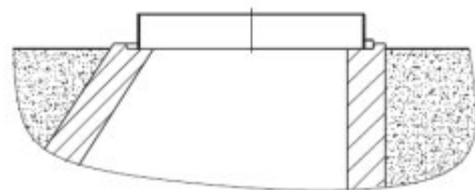
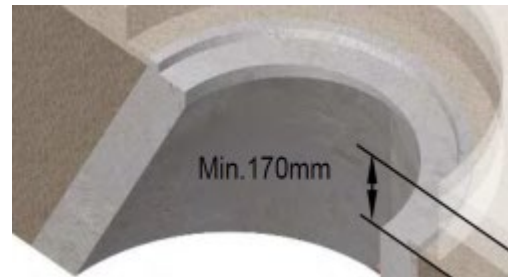
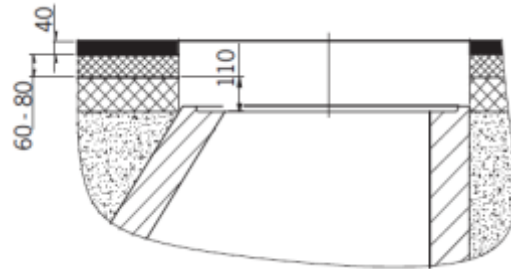
Top layer: approx. 40 mm  
 Binder layer: 60 to 80 mm

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

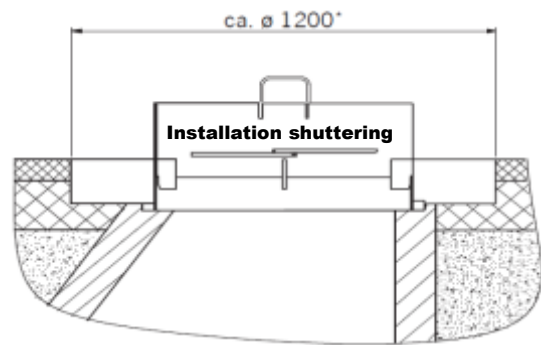
We recommend to adopt the following steps:

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.

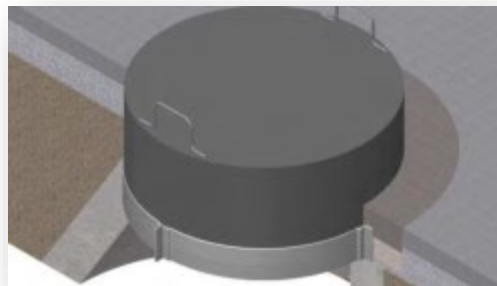
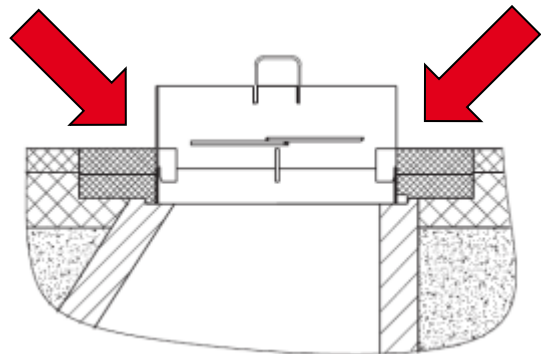
2.2 Fit adaptor ring to shaft neck



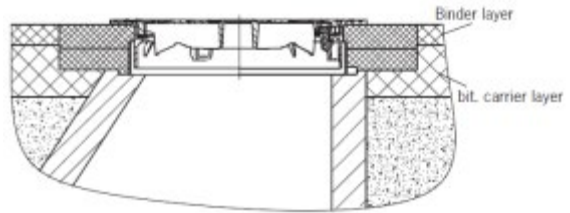
- 2.3 Mark shaft location at the road edge or kerbstone.
- 2.4 Cover the manhole opening with a steel plate.
- 2.5 Fit carrier layer and uncover the steel plate located on shaft.
- 2.6 Fit binder layer. **Caution!!** Prior to compacting binder layer, following steps have to be performed:
  - a) Uncover 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.



## 5 One Pager new road installation

(1)  
After installin the carrier layer, the installation shuttering will be inserted into the adaptor ring



(7)  
Protect the cover before installing the binder layer by using a sttel plate.



(2)  
The asphalt around the adaptor ring must be compacted very well to ensure a proper load bearing.



(8)  
The binder layer could be installed. Use this step also for the top layer.



(3)  
Draw the adaptorring carefully upwards.



(9)  
Expose the cover.



(4)  
Shaft neck, adaptorring and the carrier layer are in perfect alignment.



(10)  
Draw the cover upwards about 10-15cm to have some space left to feed the underside of the self leveling flange.



(5)  
After inserting the Bituplan manhole cover, it will be rolled into the callier layer.



(11)  
Feed the underside of the self leveling flange with min. 5-10cm of hot asphalt, then press the cover down.



(6)  
After this step, medium traffic could be already permitted to pass the cover using the carrier layer.



(12)  
Finally the cover will be rolled into the top layer.



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

**Manhole cover frame repair with manhole covers made of cast iron, LW 600, class D 400, system Bituplan® of the firm ACO Drain Passavant GmbH.**



**1**  
Remove of the defective cover and reveal of the cone



**2**  
adjustment of adapterring and sandwichring



**3**  
insert shutter and diffuse Ebralit®



**4**  
fully bedded ring



**5**  
pretreat with undercoat



**6**  
installation of bitumen shutter



**7**  
fill up workspace with asphalt



**8**  
compacting asphalt



**9**  
remove shutter



**10**  
insert the manhole frame



**11**  
seal the manhole frame with the cover



**12**  
compacting to finished road level



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