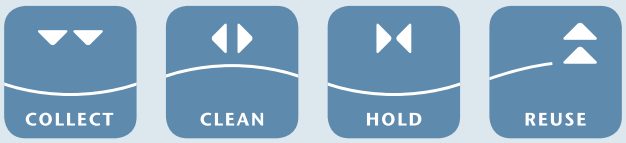
High capacity slot drainage system

ACO DRAIN® Qmax

ACO. we care for water

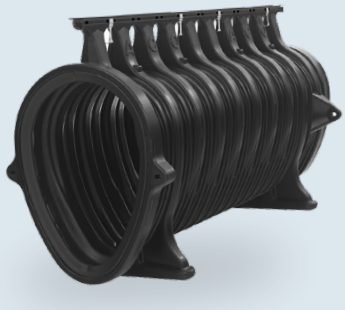


Your question – our answer:

ACO WaterCycle

The ACO WaterCycle supports you at every stage of drainage, rainwater management and treatment planning and creates the solutions for tomorrow's environmental conditions.

Where surface water management and water protection begins



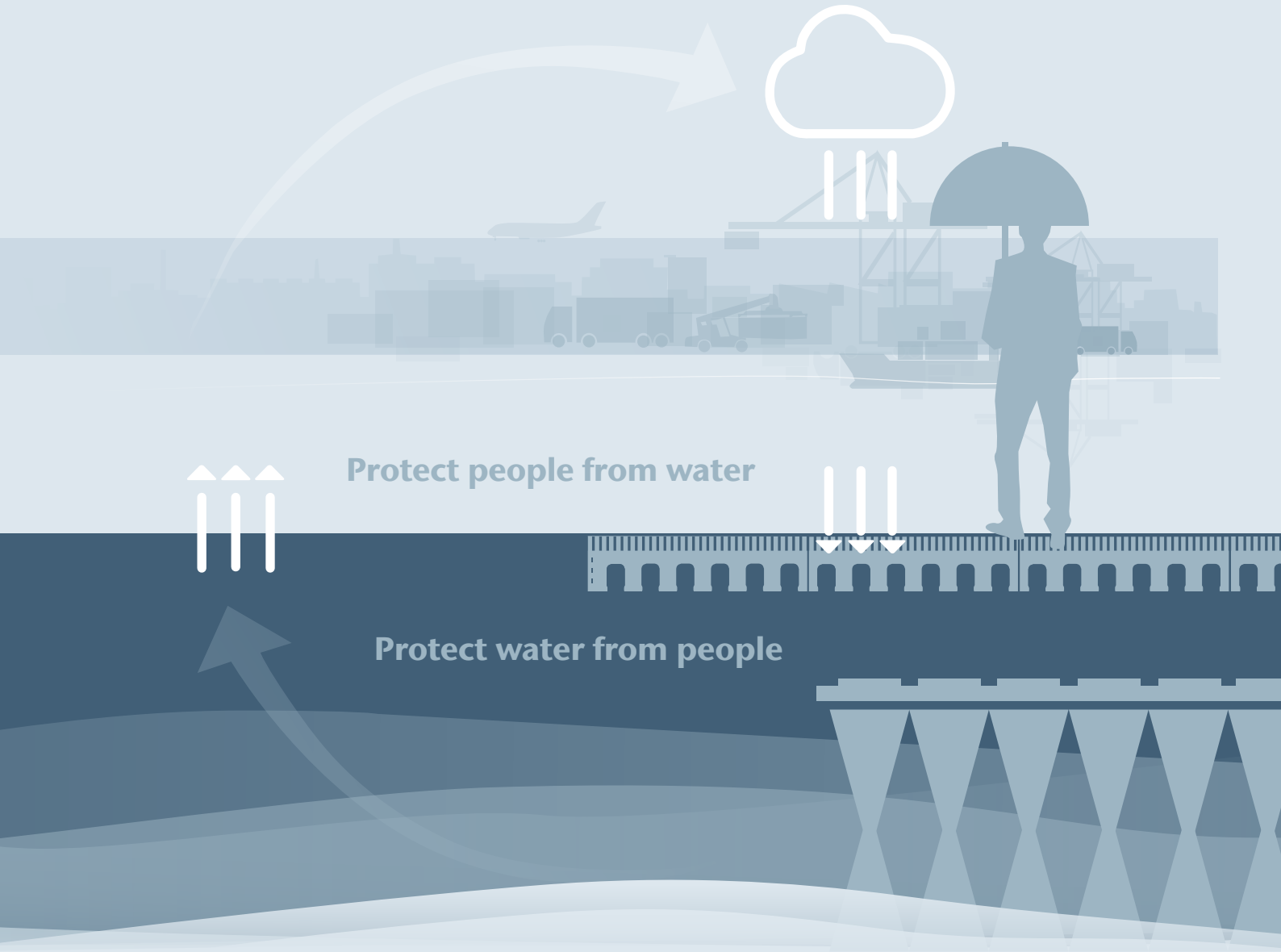
Achieving the right water quality

COLLECT

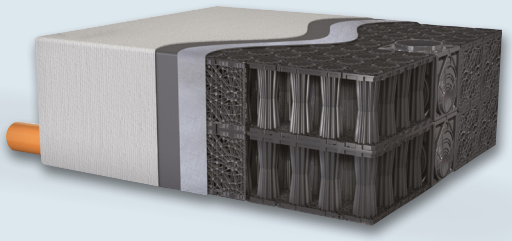
ACO surface drainage
- Drainage channels
- Road and yard drains
- Gully tops
- Manhole covers

CLEAN

ACO cleaning systems
- Separators
- Sedimentation and filter systems



Reducing surface runoff to a natural level



HOLD

ACO retention and storage systems

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

Control discharge rate to the required level

REUSE

ACO control systems

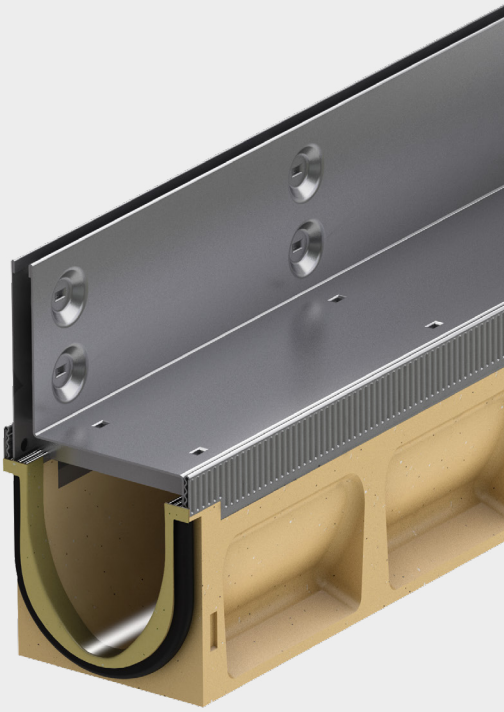
- Flow control systems
- Pump shafts

High hydraulic capacity of the sealed slotted channel

The Qmax portfolio belongs to the group of slotted channels that are also offered with integrated seals and have a large hydraulic capacity. Different types of installation recommendations allow the channel to be installed in areas with different types of loads.

ACO Multiline

Polymer concrete channel body with integrated seal offered with large variety of gratings made of cast iron, stainless, galvanized steel or plastic



ACO Qmax®

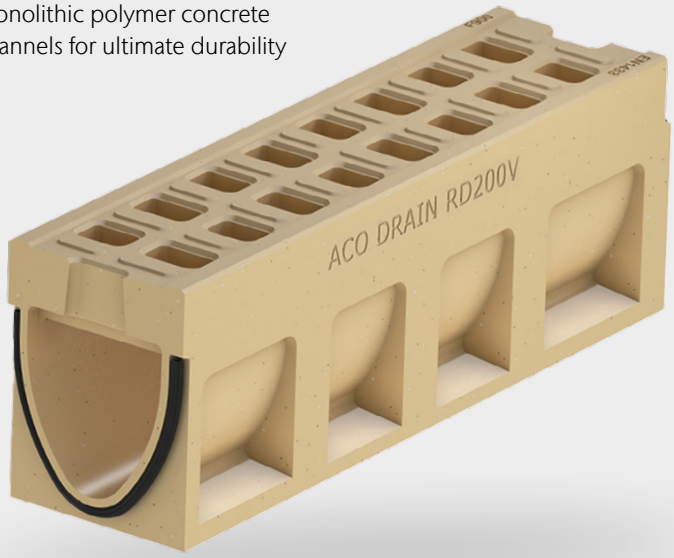
High-capacity slot drainage made of MD-PE with integrated seal and option for water retention or attenuation

ACO PowerDrain

Polymer concrete channel body with integrated seal and ductile iron frame for heavy duty applications

ACO Monoblock

Monolithic polymer concrete channels for ultimate durability



Content

ACO Surface Water Management
Online information

ACO. we care for water

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

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

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

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

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

www.aco.com

Holder
Iver and Hans-Julius Ahlmann

Headquarters of the ACO Group
in Rendsburg/Büdelsdorf

5.400

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

1,14 Billion

Euro Sales in 2023

41

production sites in 20 countries

ACO Academy
for practical training

Combination of drainage and retention

ACO Qmax is specifically designed to form an integral part of any modern, sustainable surface water management solution. The system maximises the hydraulic capacity available providing effective storage, attenuation, and eliminating carry over in stormwater conditions with highest-possible load up to F 900.

The advantage is the low weight and particularly robust construction. The ACO Qmax system can withstand high loads while maintaining easy handling on the construction site without the need for mechanization.

Load classes [1)]

- A 15
- B 125
- C 250
- D 400
- E 600
- F 900

according to DIN EN 1433

Channel sizes

150, 225, 350, 365/550, 465/700, 600/900

Material

Manufactured from tough, highly corrosion resistant PE

Areas of application

- Large sealed areas
- Hydraulic performance & retention function
- Logistics facilities
- Industrial parks
- Airport pavements

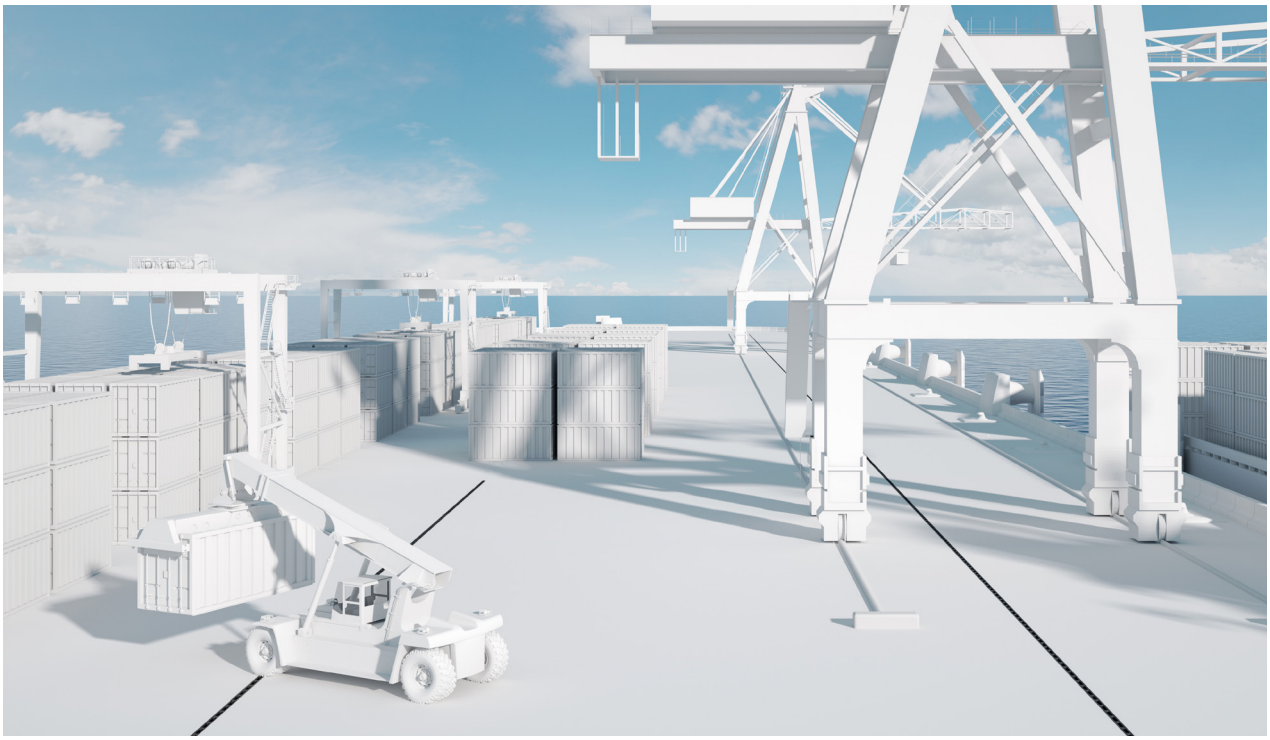
Heavy-duty channel Qmax

suitable for heavy traffic

Robust
- the used inlet grates/slots ensure a small contact area for heavy goods vehicles‘ wheels
- optimized reinforcement layout across the channel profile

Safe
- no loose or screwed components
- protection of the building structure thanks to the integrated sealing
- fluid-tight monolithic body of the channel made of polyethylene (MDPE)

Economical
- 2m long channels for simple and quick installation
- ‘Pavement beam’ feature permits continuous flow of concrete through the product, strengthening installation
- lightweight design for easy manual handling



Heavy duty retention channel Qmax

capable of holding large amounts of rainwater

Innovative
- safe and fast drainage of large areas
- intermediate retention of large amounts of water during heavy rain
- high hydraulic performance up to the nominal width of NW 600/900

Effective
- 3 in 1: Drainage, retention and stormwater drainage in one system
- realization of long sections without interruption by drainage elements
- elimination of parallel storm sewers and significant reduction of piping requirements

How does retention work?

Reliable design for heavy rainfall

Regulated flow and accumulation

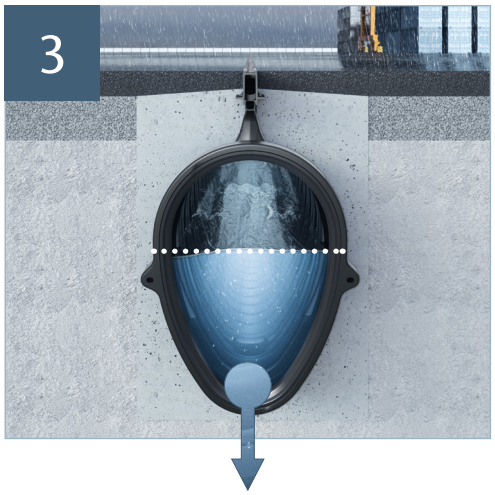
1

No rain, no runoff

2

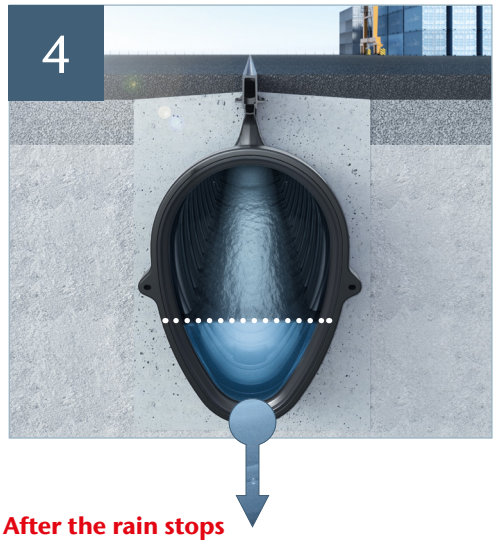
Incipient/light rain
The channel **collects rainwater**. Thanks to the ovoid geometry of the profile of the body in larger nominal sizes, high flow rates are achieved even in light rain. This ensures an ideal water outflow.

3



Heavy/torrential rains
Retention of large amounts of water due to enormous hydraulic power. Possibility to create a temporary storage area through a regulated outflow at the point of inflow into the sewerage network.

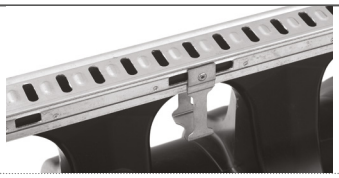
4



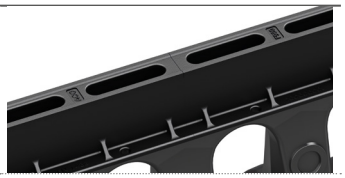
After the rain stops
Gradual outflow from the Qmax system. The water level decreases until the channel is empty again.

ACO Qmax rails

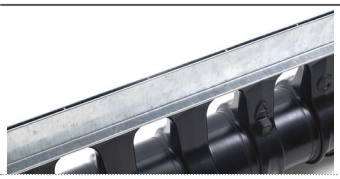
Galvanised steel

	Q-Flow	Q-Guard
		
Load class	A 15 to F 900	A 15 to F 900
Pavement type	Concrete	Concrete and asphalt
Rail protector	Supplied with channel	Supplied with channel

Ductile iron

	Q-Flow	Q-Guard	Q-Road
			
Load class	A 15 to F 900	A 15 to F 900	A 15 to F 900
Pavement type	Concrete and asphalt	Concrete and asphalt	Asphalt
Rail protector	Optional accessories, reusable	Optional accessories, reusable	Optional accessories, reusable

Galvanised steel, stainless steel or corten steel

	Q-Slot Single	Q-Slot Double	Q-Slot Stripe Corten
			
Load class	D 400	D 400	D 400
Pavement type	Block, slab and natural stone	Block, slab and natural stone	Block, slab and natural stone
Rail protector	Optional	Optional	Optional

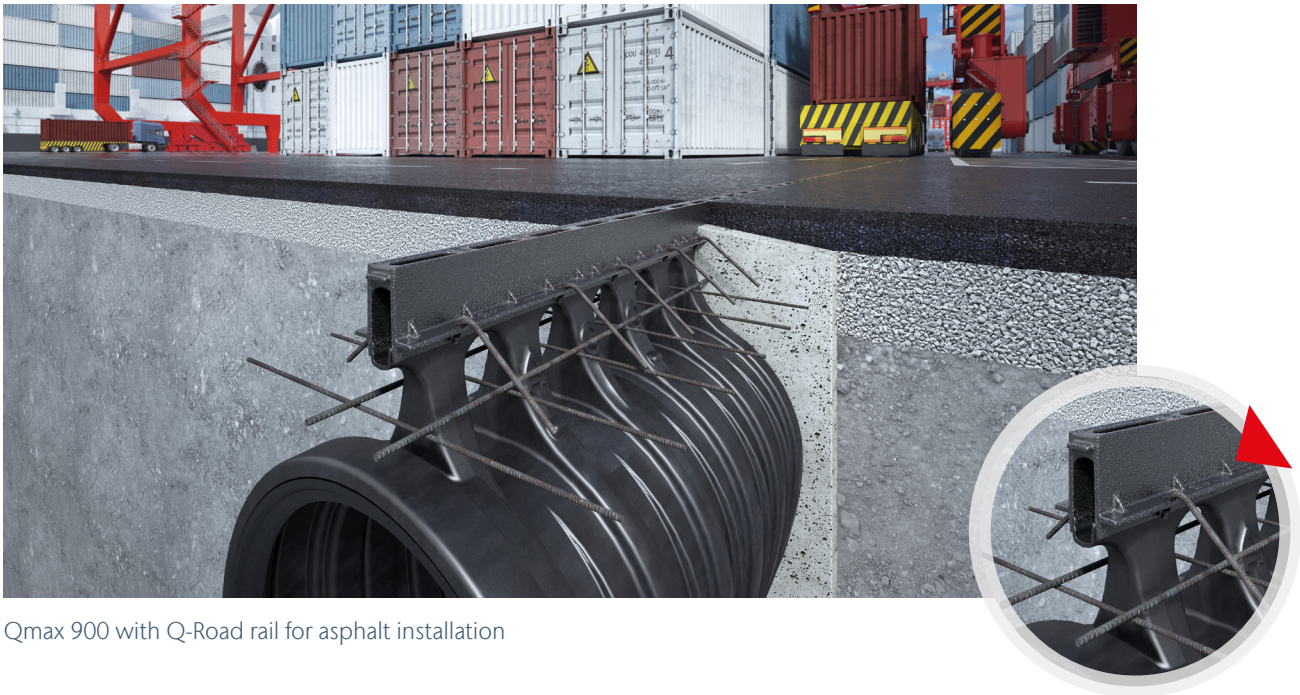
Qmax – heavy duty and retention channels

ACO Product benefits

- Supports all Load Classes up to and including F 900
- Only high capacity system with an integrated seal as standard
- Lightweight 2 metre units for easy handling on site
- ACO Qmax is easy to handle and quick to install
- Eliminates stormwater carry over
- Drainage for the surface area and simultaneous retention with large storage volumes without additional sewer work

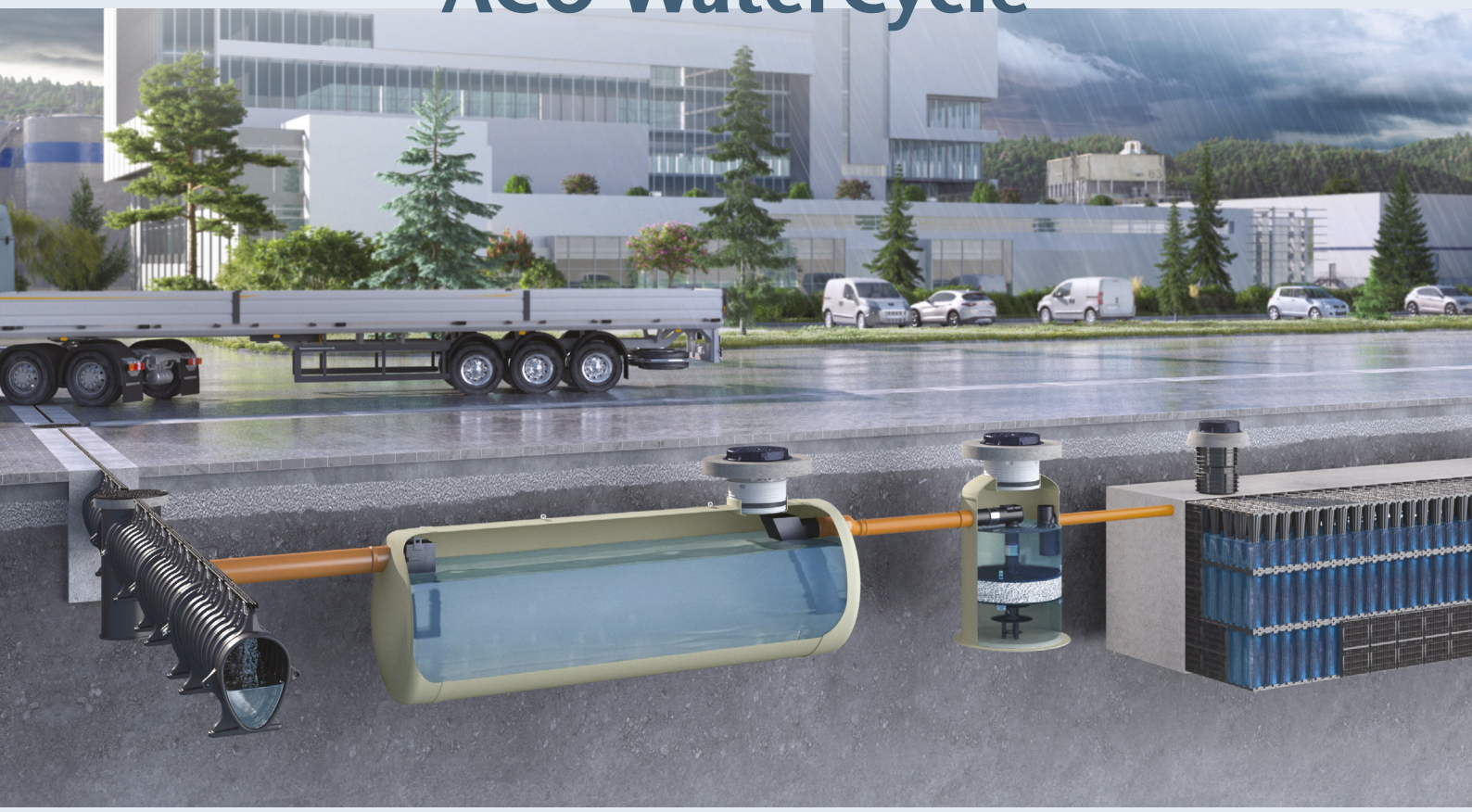
- Load class A 15 – F 900
- Qmax 150 – 900
- Attenuation capacity:
  - Qmax 350: 96 l/m
  - Qmax 550: 154 l/m
  - Qmax 700: 250 l/m
  - Qmax 900: 413 l/m

Example application



Qmax 900 with Q-Road rail for asphalt installation

ACO WaterCycle



Drainage solutions for the environmental conditions of tomorrow

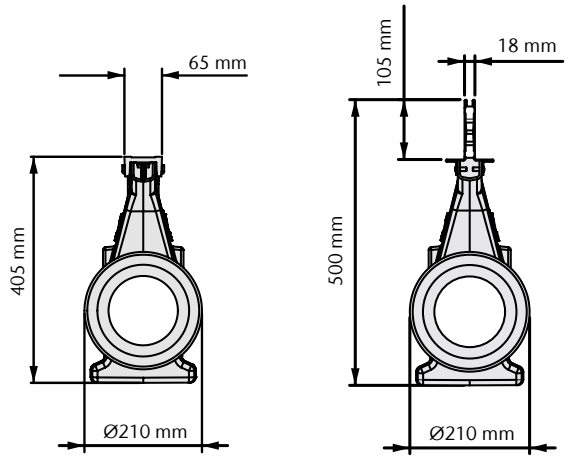
Increasingly extreme weather must be counteracted by more complex and sophisticated drainage concepts. ACO achieves this with the intelligent WaterCycle which have a dual purpose: protecting people from water, and water from people.

Every ACO product within the **ACO WaterCycle** safely controls the water as it passes along the cycle to ensure that it can be ecologically and economically reused in a viable way.

Airport Lisbon (Portugal)

Airport Zagreb (Croatia)

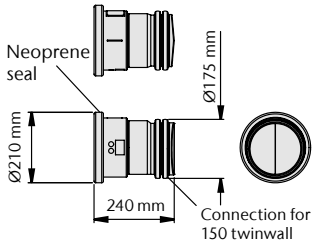
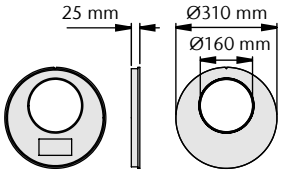
Qmax 150 channel

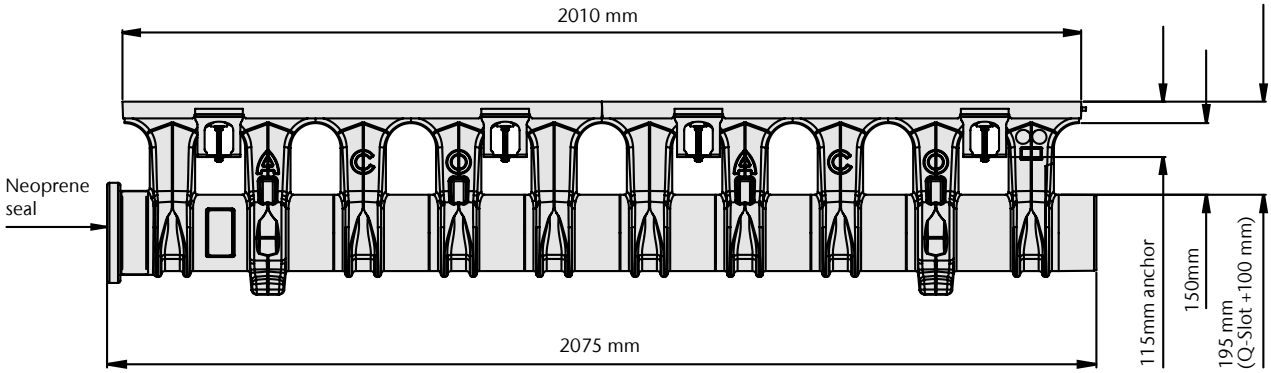


Dimensions			Rail				Weight	PU	Item No.
Length	Width	Height incl. rail	Material	Colour	Size of the inlet opening	Inlet cross-section			
[mm]	[mm]	[mm]			[mm]	[cm²/m]	[kg]	[pcs]	
Type: Q-Flow (F 900)									
2010	210	405	Ductile iron, KTL coated	black	26	187	22,0	12	32990
			Galvanised steel	GS	26	181	12,0	12	32992
Type: Q-Guard (F 900)									
2010	210	405	Ductile iron, KTL coated	black	2 x 8	109	23,0	12	32991
			Galvanised steel	GS	10	83	12,0	12	32993
Type: Q-Road (F 900)									
2000	210	515	Ductile iron	black[1)]	28	205	48,5	12	152100
Type: Q-Slot (D 400)									
2010	210	500	Galvanised steel	GS	10	100	20,5	12	32994
			Stainless steel	silver	10	100	20,5	12	3031188
Type: Q-Slot Double (D 400)									
2010	210	500	Galvanised steel	GS	2 x 9,5	190	22,0	12	3031189
			Stainless steel	silver	2 x 9,5	190	22,0	12	3031281
Type: Q-slot stripe corten (D 400)									
2010	210	500	Corten steel	corten	10	100	24,7	12	3031282

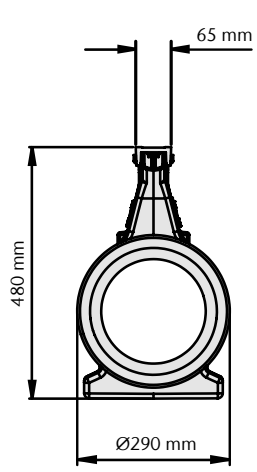
[1)] This ductile iron grate is painted with basic black paint. This is not a permanent coating but a transport coating.

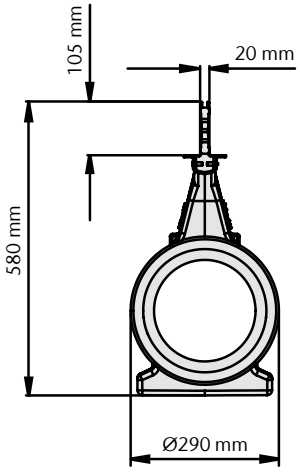
Qmax 150 channel – Accessories

		Length [mm]	Width [mm]	Depth [mm]	Weight [kg]	Item no.
	**Multifunctional end cap (closing/outlet/inlet)** ■ Male and female closing end cap ■ Male and female inlet/outlet end cap for connection to Ø150 mm twinwall pipe ■ Simple fitting ■ Installation instructions supplied	240	Ø210	–	1	32997
	**Step connector** ■ Enables step fall installations of Qmax 150 and Qmax 225 channels ■ For use between Qmax 150 male and Qmax 225 female channel connections ■ Simple fitting ■ Installation instructions supplied	–	Ø310	25	0,4	32995
	Ductile iron edge rail protector ■ Used to cover and protect rails from debris during installation ■ Simple fitting ■ Can be reused	15,25	65	1,5	5,0	32854



Qmax 225 channel

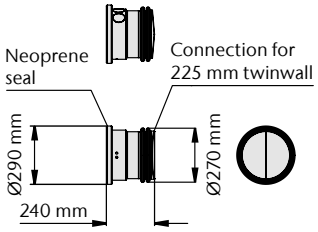
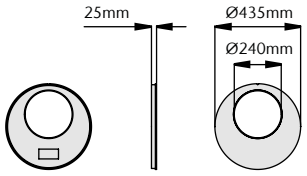
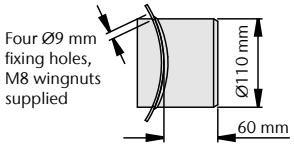


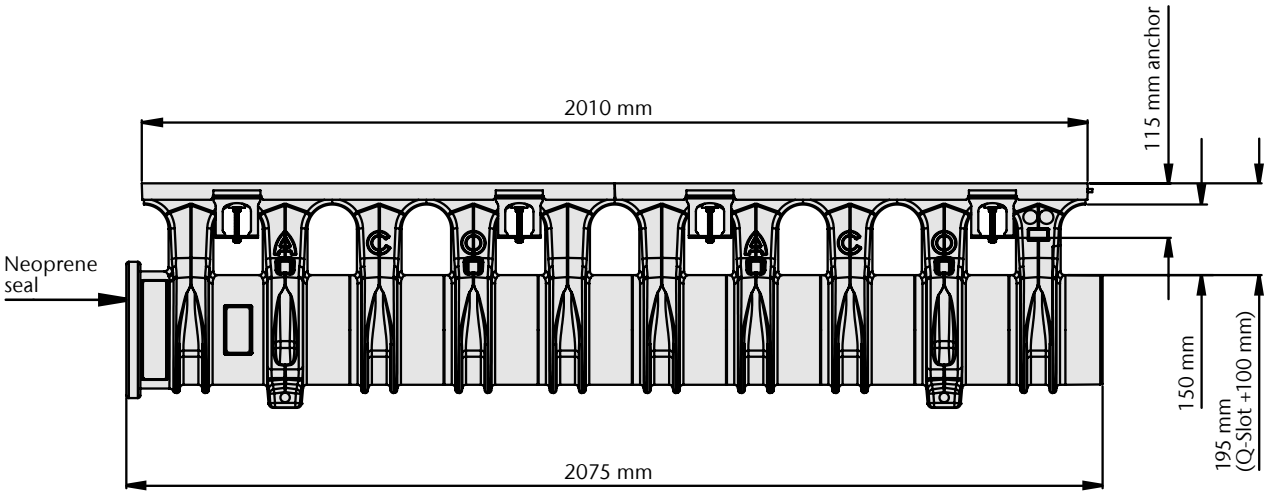


Dimensions			Rail				Weight	PU	Item no.
Length	Width	Height incl. rail	Material	Colour	Size of the inlet opening	Inlet cross-section			
[mm]	[mm]	[mm]			[mm]	[cm²/m]	[kg]	[pcs]	
Type: Q-Flow (F 900)									
2010	290	480	Ductile iron, KTL coated	black	26	187	24,0	8	32800
			Galvanised steel	GS	26	181	17,8	8	32802
Type: Q-Guard (F 900)									
2010	290	480	Ductile iron, KTL coated	black	2 x 8	109	25,0	8	32801
			Galvanised steel	GS	10	83	15,3	8	32803
Type: Q-Road (F 900)									
2000	290	590	Ductile iron	black[1)]	28	205	52,8	8	152110
Type: Q-Slot (D 400)									
2010	290	580	Galvanised steel	GS	10	100	22,9	8	32804
			Stainless steel	silver	10	100	22,9	8	3031284
Type: Q-Slot Double (D 400)									
2010	290	580	Galvanised steel	GS	2 x 9,5	190	24,4	8	3031285
			Stainless steel	silver	2 x 9,5	190	24,4	8	3031286
Type: Q-slot stripe corten (D 400)									
2010	290	580	Corten steel	corten	10	100	27,1	8	3031287

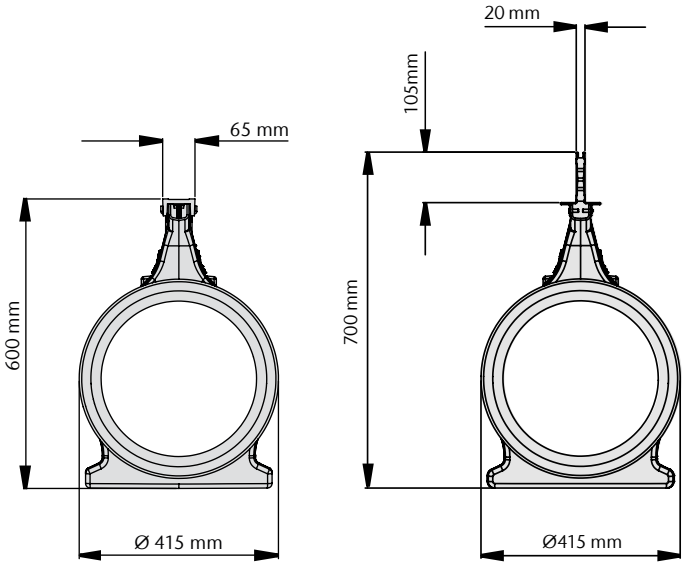
[1)] This ductile iron grate is painted with basic black paint. This is not a permanent coating but a transport coating.

sQmax 225 channel – Accessories

	Description	Length [mm]	Width [mm]	Depth [mm]	Weight [kg]	Item no.
	**Multifunctional end cap (closing/outlet/inlet)** ■ Male and female closing end cap ■ Male and female inlet/outlet end cap for connection to Ø225 mm twinwall pipe ■ Simple fitting ■ Installation instructions supplied	240	Ø290	Ø290	1,4	42221
	**Step connector** ■ Enables step fall installations of Qmax 225 and Qmax 350 channels ■ For use between Qmax 225 male and Qmax 350 female channel connections ■ Simple fitting ■ Installation instructions supplied	25	Ø435	–	0,8	32880
	**Downpipe connector Ø110 mm outlet** ■ Allows the connection of rain water pipes into the body of Qmax channels ■ Simple fitting	100	120	146	0,16	44344
	Ductile iron edge rail protector ■ Used to cover and protect rails from debris during installation ■ Simple fitting ■ Can be reused	15,25	65	1,5	5,0	32854



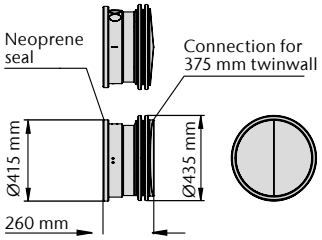
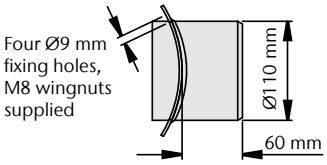
Qmax 350 channel

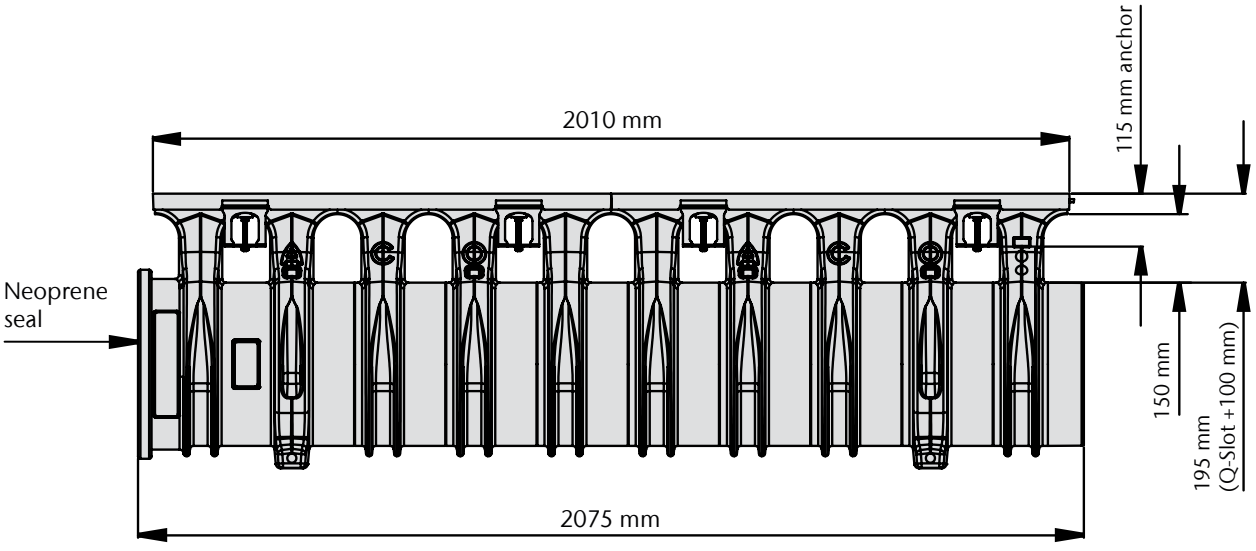


Dimensions			Rail				Weight	PU	Item no.
Length	Width	Height incl. rail	Material	Colour	Size of the inlet opening	Inlet cross-section			
[mm]	[mm]	[mm]			[mm]	[cm²/m]	[kg]	[pcs]	
Type: Q-Flow (F 900)									
2010	415	600	Ductile iron, KTL coated	black	26	187	28,3	4	32810
			Galvanised steel	GS	26	181	24,0	4	32812
Type: Q-Guard (F 900)									
2010	415	600	Ductile iron, KTL coated	black	2 x 8	109	29,3	4	32811
			Galvanised steel	GS	10	83	21,5	4	32813
Type: Q-Road (F 900)									
2000	415	710	Ductile iron	black[1)]	28	205	59,0	4	152120
Type: Q-Slot (D 400)									
2010	415	700	Galvanised steel	GS	10	100	29,1	4	32814
			Stainless steel	silver	10	100	29,1	4	3031311
Type: Q-Slot Double (D 400)									
2010	415	700	Galvanised steel	GS	2 x 9,5	190	30,6	4	3031312
			Stainless steel	silver	2 x 9,5	190	30,6	4	3031313
Type: Q-slot stripe corten (D 400)									
2010	415	700	Corten steel	corten	10	100	33,3	4	3031314

[1)] This ductile iron grate is painted with basic black paint. This is not a permanent coating but a transport coating.

Qmax 350 channel – Accessories

	Description	Length [mm]	Width [mm]	Depth [mm]	Weight [kg]	Item no.
	**Multifunctional end cap (closing/outlet/inlet)** ■ Male and female closing end cap ■ Male and female inlet/outlet end cap for connection to 375 mm twinwall pipe ■ Simple fitting ■ Installation instructions supplied	260	Ø415	Ø415	2,6	42351
	**Downpipe connector Ø110 mm outlet** ■ Allows the connection of rain water pipes into the body of Qmax channels ■ Simple fitting	100	120	146	0,16	44344
	Ductile iron edge rail protector ■ Used to cover and protect rails from debris during installation ■ Simple fitting ■ Can be reused	15,25	65	1,5	5,0	32854



Qmax 150, 225 and 350 access, outlet/inlet and silt chambers

Qmax 150, 225 & 350 access, outlet/inlet and silt chambers provide a compact and economical method of gaining access to the channel system for maintenance and cleaning, connections to traditional underground drainage networks, or silt management.

These chambers are specifically designed for use with Qmax 150, 225 and 350 channels and allow 4-way channel connections to be made for simple directional changes and optimised scheme designs.

The three arrangements allow flexibility to Qmax installations, and depending on pipe connections can be used purely as an access point or an access unit incorporating a silt chamber.

Qmax outlet/inlet and silt chambers provide outlet pipe connection to 160 mm PVC-U, 200 mm, 225 mm and 300 mm twinwall or clay pipe work. They also allow 110mm PVC-U inlet connections to be made, reducing the need for additional underground pipe work.

Qmax access, outlet/inlet and silt chambers are manufactured from PE which is lightweight, tough and chemically resistant.

Cover and frame options:
The chambers come complete with a ductile iron slotted cover and frame available in either a lockable D 400 or hinged F 900 versions. An ACO Q-Slot D 400 galvanised steel recessed cover and frame for use with up to 100mm block paving, slab and natural stone is also available.

Materials used in the construction of Qmax chambers contain high levels of recycled materials and are themselves recyclable at the end of their life.

D 400 / F 900 ductile iron slotted cover and frame

ACO Q-Slot D 400 galvanised steel recessed cover and frame

Qmax 150, 225 and 350 shallow access chamber with silt collection

Qmax 150, 225 & 350 shallow access chambers provide a compact method of local silt management whilst also providing access to the channel system for maintenance and cleaning.

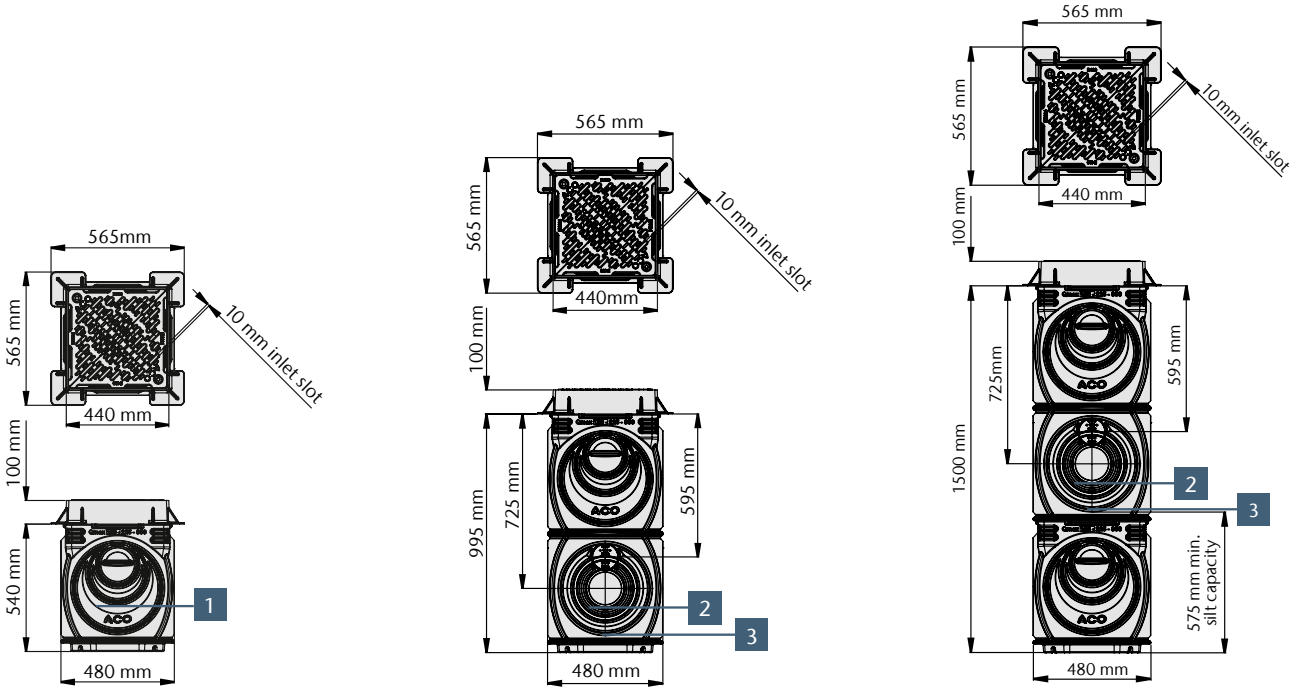
These chambers are specifically designed for use with Qmax 150, 225 and 350 channels and allow 4-way channel connections combined with a silt collection within shallow installations.

Cover and frame options:
The chambers are supplied with a ductile iron slotted cover and frame available in either a lockable D 400 or F 900 versions.

Materials used in the construction of Qmax chambers contain high levels of recycled materials and are themselves recyclable at the end of their life.

Qmax 150, 225 and 350 channel access, outlet/inlet and silt chambers with slotted cover and frame

Description	Length	Width	Depth	Slot width	Weight	Item no.
	[mm]	[mm]	[mm]	[mm]	[kg]	
Access chamber with D 400 slotted cover and frame	565	565	640	10	48	32970
Access chamber with F 900 slotted cover and frame	660	660	640	19	77,5	32971
Outlet/inlet chamber with D 400 slotted cover and frame	565	565	1095	10	52	32972
Outlet/inlet chamber with F 900 slotted cover and frame	660	660	1095	19	81,5	32973
Outlet/inlet/Silt chamber with D 400 slotted cover and frame	565	565	1600	10	60	32974
Outlet/inlet/Silt chamber with F 900 slotted cover and frame	660	660	1600	19	89,5	32975



1 **150, 225 & 350 channel connection**
Image shows Qmax 150, 225 and 350 access chamber with D 400 slotted cover and frame. Also available in Load Class F 900

2 **110 mm PVC-U inlet connection**
Image shows Qmax 150, 225 and 350 access/outlet/inlet chamber with D 400 slotted cover and frame. Also available in Load Class F 900.

3 **160 mm PVC-U, 200 mm, 225 mm and 300 mm twinwall or clay outlet connection**
Image shows Qmax 150, 225 and 350 access/outlet/inlet/silt chamber with D 400 slotted cover and frame. Also available in Load Class F 900.

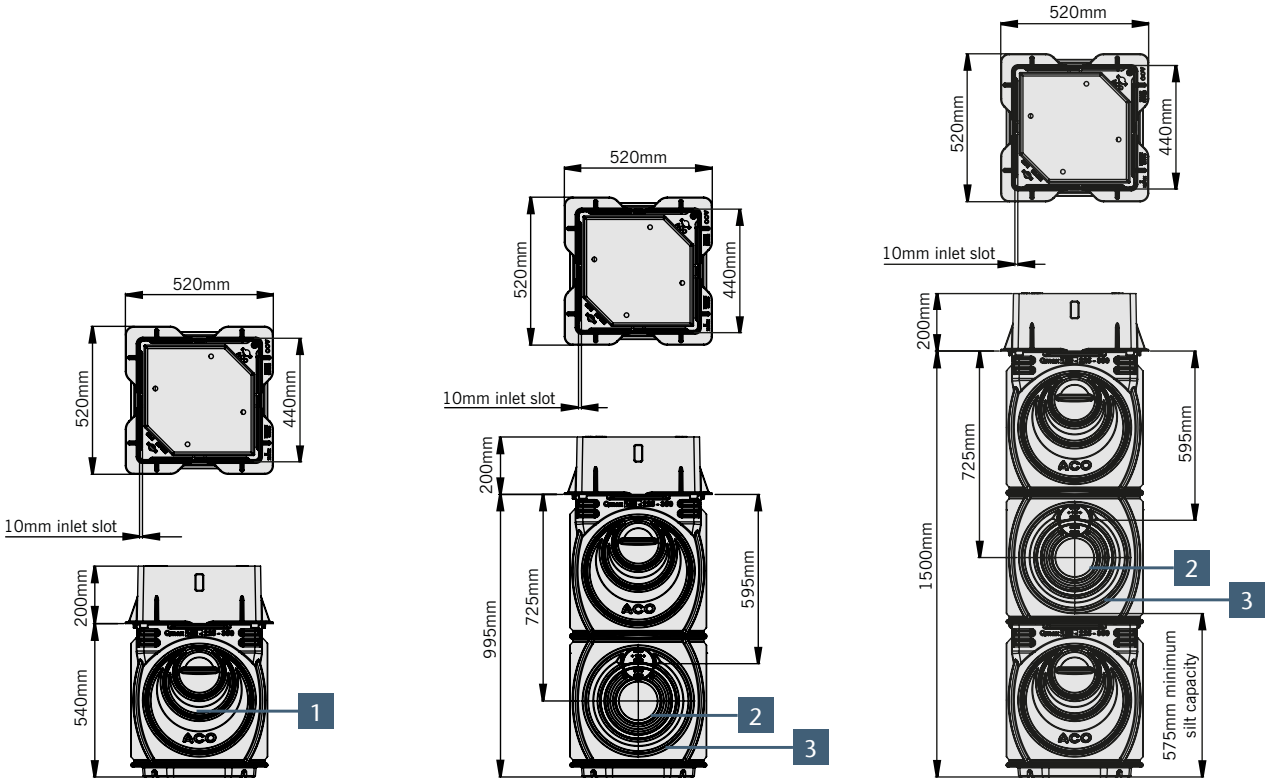
Qmax 150, 225 and 350 shallow channel access, outlet/inlet and silt chamber with slotted cover and frame

Description	Length	Width	Depth	Slot width	Weight	Item no.
	[mm]	[mm]	[mm]	[mm]	[kg]	
Shallow access chamber and silt collection with D 400 slotted cover and frame	760	760	885	21	97,5	46110
Shallow access chamber and silt collection with D 400 solid cover and frame	760	760	885	–	92	46111
Shallow access chamber and silt collection with F 900 slotted cover and frame	760	760	885	21	122	46112
Shallow access chamber and silt collection with F 900 solid cover and frame	760	760	885	–	110	46113

* These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.

Qmax 150, 225 and 350 channel access, outlet/inlet and silt chambers with ACO Q-Slot cover and frame

Description	Length	Width	Depth	Slot width	Weight	Item no.
	[mm]	[mm]	[mm]	[mm]	[kg]	
Access chamber with D 400 ACO Q-Slot recessed cover and frame	520	520	740	10	55,5	32976
Outlet/inlet chamber with D 400 ACO Q-Slot recessed cover and frame	520	520	1195	10	59,5	32977
Outlet/inlet/silt chamber with D 400 ACO Q-Slot recessed cover and frame	520	520	1700	10	67,5	32978



1 **150, 225 & 350 channel connection**
Qmax 150, 225 and 350 access chamber with D 400 ACO Q-Slot recessed cover and frame.

2 **110 mm PVC-U inlet connection**
Qmax 150, 225 and 350 outlet/inlet chamber with D 400 ACO Q-Slot recessed cover and frame.

3 **160mm PVC-U, 200 mm, 225 mm and 300 mm twinwall or clay outlet connection**
Qmax 150, 225 and 350 outlet/inlet/silt chamber with D 400 ACO Q-Slot recessed cover and frame.

Maximum outlet capacity (assuming water level to the crown of the channel bore)

160 mm	200 mm	225 mm	300 mm
45 l/s	71 l/s	90 l/s	159 l/s

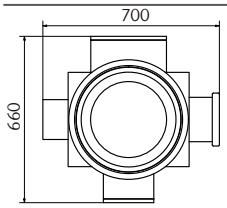
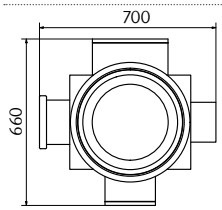
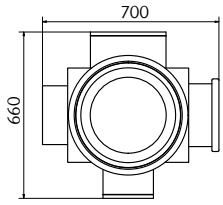
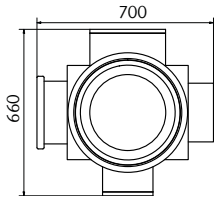
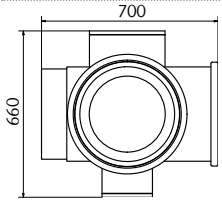
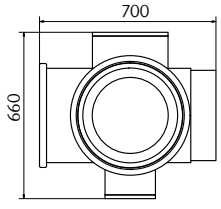
Table and values apply to 32970 and 32975

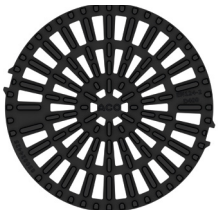
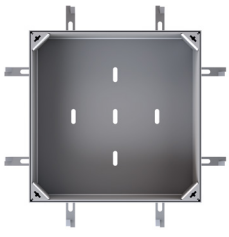
* These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.

Qmax 150, 225 and 350 revision part

- Revision part allow 2-way connection and is used for revision channel line, maintenance and cleaning.
- Direct and tight connection of channels to chamber.
- Sealing already installed into chamber, push-fit system.
- Induvidual solution can be configured via ACO product configurator:
  - Connection of different nominal sizes
  - Position of the integrated connection adapter, for example for corner connection
  - Raised version for channels with Q-Road, Q-Slot rail

Order information

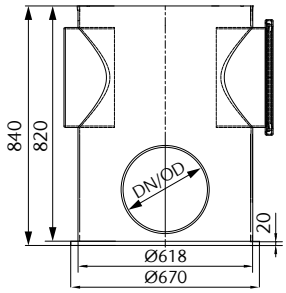
	Dimensions			Outlet pipe	Type of channel	Weight	Item no.
	Length [mm]	Width [mm]	Depth [mm]			[kg]	
	700	660	670	DN300/DN200	Qmax 150	10,9	418985
	700	660	670	DN200/DN300	Qmax 150	10,9	418986
	700	660	670	DN300/DN200	Qmax 225	11	418987
	700	660	670	DN200/DN300	Qmax 225	11	418988
	700	660	670	DN300/DN200	Qmax 350	11	418992
	700	660	670	DN200/DN300	Qmax 350	11	418993

		Description		Item No.
		ACO Qmax COVER D400 NW425		1000228
		ACO Qmax GRATING D400 NW425		1000229
		ACO Qmax FRAME D400 NW425 H200		1000230
		ACO Qmax COVER F900 NW425		1207548
		ACO Qmax GRATING F900 NW425		1207692
		ACO Qmax FRAME F900 NW425 H200		1207632
		ACO Qmax Q-Slot COVER D400	Galvanised steel	450918
			Stainless steel	450919
			Corten steel	450920

Qmax 150, 225 and 350 access chamber PEHD

- Access chamber allow 4-way connection and is used for revision channel line, maintenance and cleaning, connection to traditional underground drainage networks.
- Direct and tight connection of channels to chamber.
- Sealing already installed into chamber, push-fit system.
- Induvidual solution can be configured via ACO product configurator:
  - Connection of different nominal sizes
  - Position of the integrated connection adapter, for example for corner connection
  - Raised version for channels with Q-Road, Q-Slot rail
  - Individual diameter of outlet pipe DN/OD 110-DN400

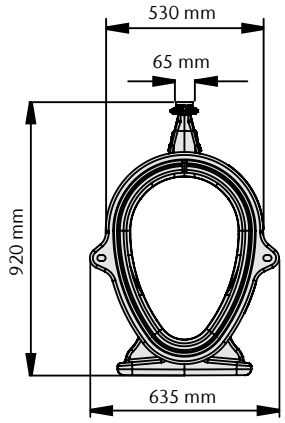
Order information

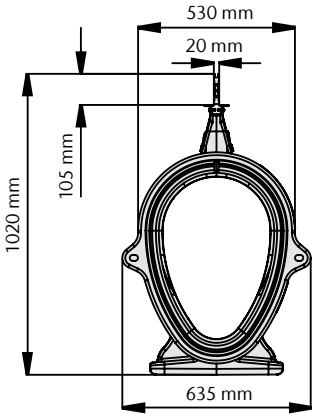
	Dimensions			Outlet pipe DN/OD	Type of channel	Weight	Item no.
	Length [mm]	Width [mm]	Depth [mm]			[kg]	
	525	565	840	160	Qmax 150	15,5	152104
	525	565	840	200	Qmax 225	16,7	152105
	525	565	840	200	Qmax 350	17,9	152106

Covers for Qmax 150, 225 and 350 access chamber PEHD

	Dimensions			Variant cover	Material	Weight	Item no.
	Length [mm]	Width [mm]	Depth [mm]			[kg]	
	785	785	125	Multitop Plus D 400	Ductile iron	111	210510
	785	785	125	Multitop Plus F 900	Ductile iron	111	210550
	770	770	128,5	Q-Slot cover	Galvanised steel	85	450915
					Stainless steel	85	450916
					Corten steel	85	450917

Qmax 550 channel



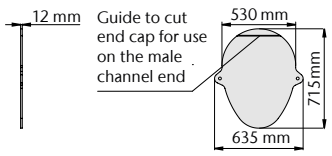
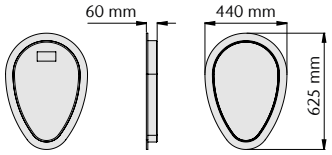
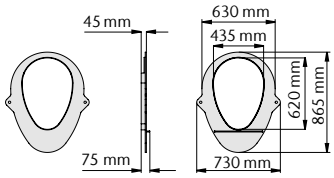
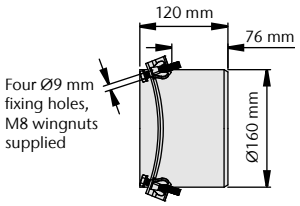


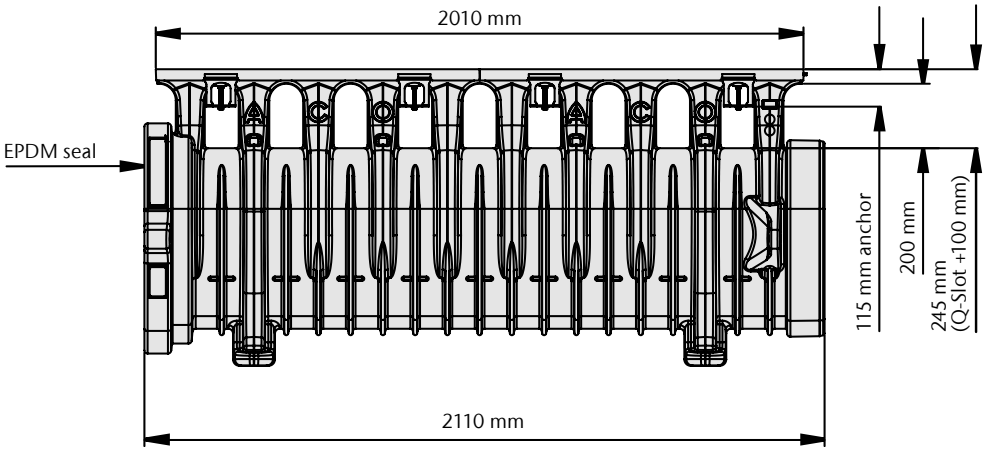
Dimensions			Rail				Weight	PU	Item no.
Length	Width	Height incl. rail	Material	Colour	Size of the inlet opening	Inlet cross-section			
[mm]	[mm]	[mm]			[mm]	[cm²/m]	[kg]	[pcs]	
Type: Q-Flow (F 900)									
2010	635	920	Ductile iron, KTL coated	black	26	187	44,0	*	32820
			Galvanised steel	GS	26	181	35,6	*	32822
Type: Q-Guard (F 900)									
2010	635	920	Ductile iron, KTL coated	black	2 x 8	109	45,0	*	32821
			Galvanised steel	GS	10	83	33,1	*	32823
Type: Q-Road (F 900)									
2000	635	1030	Ductile iron	black[1)]	28	205	70,4	*	132568
Type: Q-Slot (D 400)									
2010	635	1020	Galvanised steel	GS	10	100	40,7	*	32824
			Stainless steel	silver	10	100	40,7	*	3031315
Type: Q-Slot Double (D 400)									
2010	635	1020	Galvanised steel	GS	2 x 9,5	190	42,2	*	3031316
			Stainless steel	silver	2 x 9,5	190	42,2	*	3031317
Type: Q-slot stripe corten (D 400)									
2010	635	1020	Corten steel	corten	10	100	44,9	*	3031318

[1)] This ductile iron grate is painted with basic black paint. This is not a permanent coating but a transport coating.

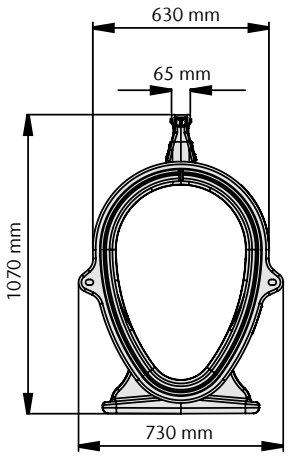
* Storage and transport is not on pallets, more information on request.

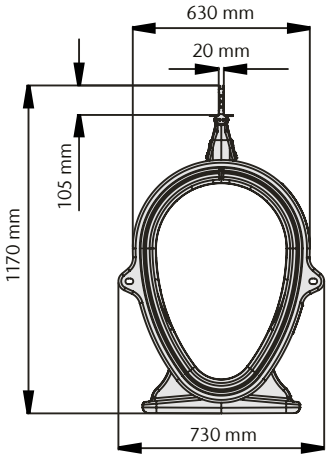
Qmax 550 channel – Accessories

	Description	Length [mm]	Width [mm]	Depth [mm]	Weight [kg]	Item no.
	**Closing end cap**	635	12	715	3,5	32825
	**Blanking end cap** ■ Enables cut channels to be capped off if cut to length during installation ■ Simple fitting ■ Installation instructions supplied	440	60	625	2,1	32886
	**Step connector** ■ Enables step fall installations of Qmax 550 and Qmax 700 channels ■ For use between Qmax 550 male and Qmax 700 female channel connections ■ Simple fitting ■ Installation instructions supplied	730	75	865	2,5	32882
	**Downpipe connector Ø160 mm outlet** ■ Allows the connection of rain water pipes into the body of Qmax channels ■ Simple fitting	120	178	197	0,16	44345
	Ductile iron edge rail protector ■ Used to cover and protect rails from debris during installation ■ Simple fitting ■ Can be reused	15,25	65	1,5	5,0	32854



Qmax 700 channel



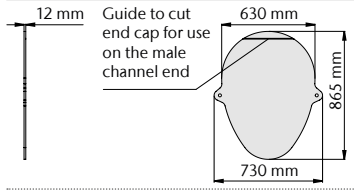
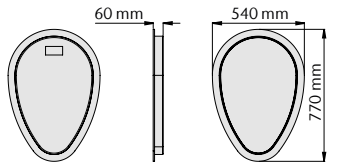
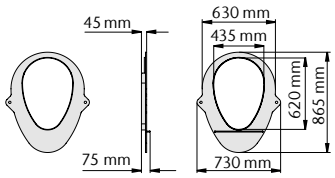
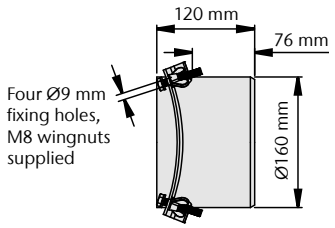


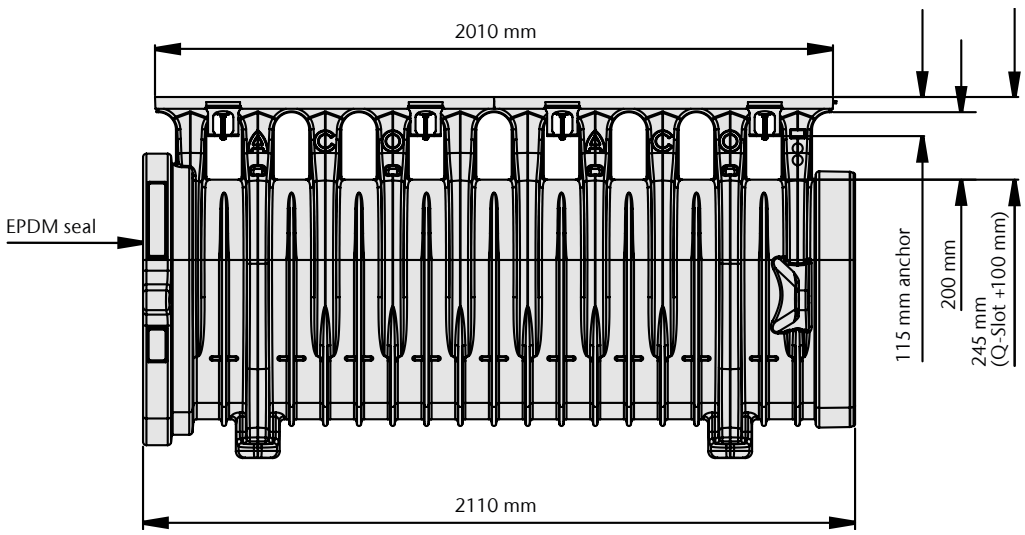
Dimensions			Rail				Weight	PU	Item no.
Length	Width	Height incl. rail	Material	Colour	Size of the inlet opening	Inlet cross-section			
[mm]	[mm]	[mm]			[mm]	[cm²/m]	[kg]	[pcs]	
Type: Q-Flow (F 900)									
2010	730	1070	Ductile iron, KTL coated	black	26	187	49,7	*	32830
			Galvanised steel	GS	26	181	41,9	*	32832
Type: Q-Guard (F 900)									
2010	730	1070	Ductile iron, KTL coated	black	2 x 8	109	50,7	*	32831
			Galvanised steel	GS	10	83	39,4	*	32833
Type: Q-Road (F 900)									
2000	730	1180	Ductile iron	black[1)]	28	205	76,9	*	132569
Type: Q-Slot (D 400)									
2010	730	1170	Galvanised steel	GS	10	100	47,0	*	32834
			Stainless steel	silver	10	100	47,0	*	3031319
Type: Q-Slot Double (D 400)									
2010	730	1170	Galvanised steel	GS	2 x 9,5	190	48,5	*	3031331
			Stainless steel	silver	2 x 9,5	190	48,5	*	3031332
Type: Q-slot stripe corten (D 400)									
2010	730	1170	Corten steel	corten	10	100	51,2	*	3031333

[1)] This ductile iron grate is painted with basic black paint. This is not a permanent coating but a transport coating.

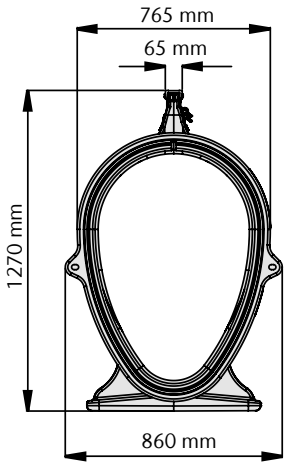
* Storage and transport is not on pallets, more information on request.

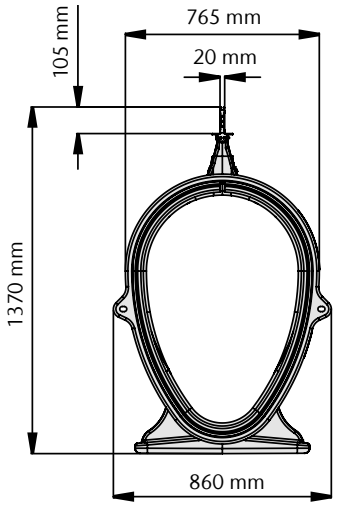
Qmax 700 channel – Accessories

	Description	Length [mm]	Width [mm]	Depth [mm]	Weight [kg]	Item no.
	**Closing end cap**	730	12	865	4,9	32835
	**Blanking end cap** ■ Enables cut channels to be capped off if cut to length during installation ■ Simple fitting ■ Installation instructions supplied	540	60	770	3,1	32887
	**Step connector** ■ Enables step fall installations of Qmax 700 and Qmax 900 channels ■ For use between Qmax 700 male and Qmax 900 female channel connections ■ Simple fitting ■ Installation instructions supplied	860	95	1065	3,7	32883
	**Downpipe connector Ø160 mm outlet** ■ Allows the connection of rain water pipes into the body of Qmax channels ■ Simple fitting	120	178	197	0,16	44345
	Ductile iron edge rail protector ■ Used to cover and protect rails from debris during installation ■ Simple fitting ■ Can be reused	15,25	65	1,5	5,0	32854



Qmax 900 channel



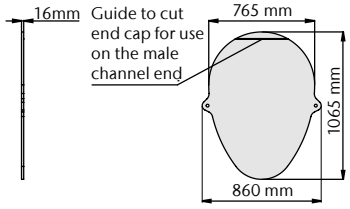
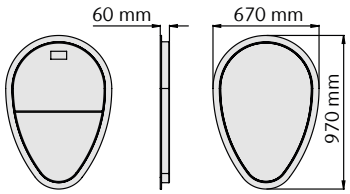
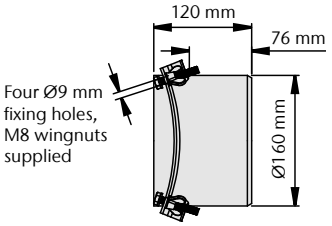


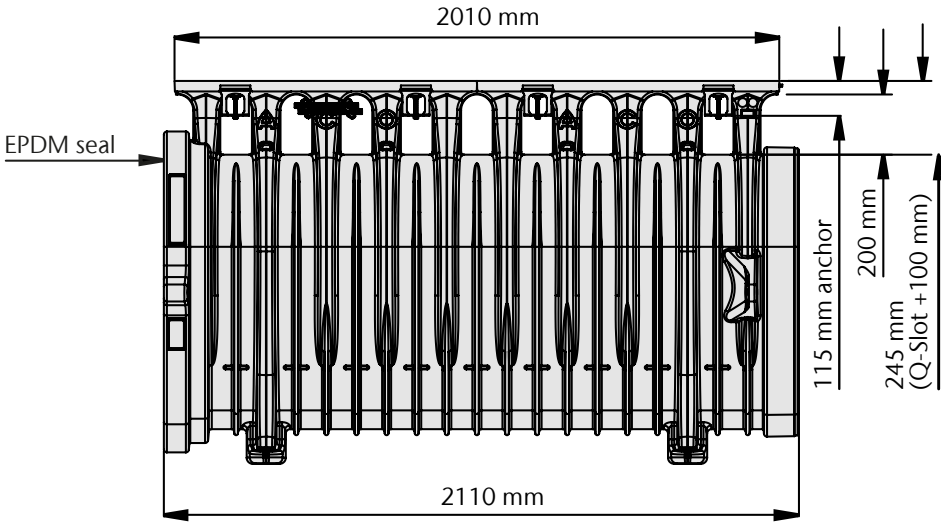
Dimensions			Rail				Weight	PU	Item no.
Length	Width	Height incl. rail	Material	Colour	Size of the inlet opening	Inlet cross-section			
[mm]	[mm]	[mm]			[mm]	[cm²/m]	[kg]	[pcs]	
Type: Q-Flow (F 900)									
2010	860	1270	Ductile iron, KTL coated	black	26	187	65,3	*	32840
			Galvanised steel	GS	26	181	57,2	*	32842
Type: Q-Guard (F 900)									
2010	860	1270	Ductile iron, KTL coated	black	2 x 8	109	66,3	*	32841
			Galvanised steel	GS	10	83	54,7	*	32843
Type: Q-Road (F 900)									
2000	860	1380	Ductile iron	black[1)]	28	205	89,4	*	132570
Type: Q-Slot (D 400)									
2010	860	1370	Galvanised steel	GS	10	100	62,3	*	32844
			Stainless steel	silver	10	100	62,3	*	3031335
Type: Q-Slot Double (D 400)									
2010	860	1370	Galvanised steel	GS	2 x 9,5	190	63,8	*	3031336
			Stainless steel	silver	2 x 9,5	190	63,8	*	3031337
Type: Q-slot stripe corten (D 400)									
2010	860	1370	Corten steel	corten	10	100	66,5	*	3031338

[1)] This ductile iron grate is painted with basic black paint. This is not a permanent coating but a transport coating.

* Storage and transport is not on pallets, more information on request.

Qmax 900 channel – Accessories

	Description	Length [mm]	Width [mm]	Depth [mm]	Weight [kg]	Item no.
	**Closing end cap**	860	16	1065	9,8	32845
	**Blanking end cap** ■ Enables cut channels to be capped off if cut to length during installation ■ Simple fitting ■ Installation instructions supplied	670	60	970	4,9	32888
	**Downpipe connector Ø160 mm outlet** ■ Allows the connection of rain water pipes into the body of Qmax channels ■ Simple fitting	120	178	197	0,16	44345
	Ductile iron edge rail protector ■ Used to cover and protect rails from debris during installation ■ Simple fitting ■ Can be reused	15,25	65	1,5	5,0	32854



Qmax 550, 700 and 900 access and silt chambers

The Qmax 550, 700 & 900 access and silt chamber provides a compact and economical method of gaining access to the channel system for maintenance and cleaning, or silt management.

The chamber is specifically designed for use with Qmax 550, 700 and 900 channels and allow 4-way channel connections to be made for simple directional changes and optimised scheme designs.

Qmax 225 and 350 channel connections are also provided where large silt capacities are required or if all channel sizes are to be connected to the access chamber.

The Qmax access and silt chamber is manufactured from PE which is lightweight, tough and chemically resistant.

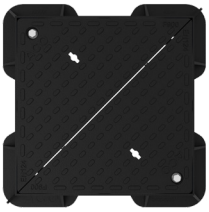
Cover and frame options:
The chambers come complete with either a ductile iron slotted or solid double triangular cover and frame. Both options are available in Load Class D 400 or F 900. As standard all F 900 ductile iron slotted or solid covers are lockable for added product and site security.

Where access and silt chambers are to be used in conjunction with Qmax Q-slot channels, a recessed cover and frame supplied by others can be used in conjunction with the Qmax 550, 700 and 900 access and silt chamber bodies.

For further details of the chambers supplied without covers and frames, please contact the ACO Water Management Customer Support Team on 01462 816666.

Materials used in the construction of Qmax chambers contain high levels of recycled materials and are themselves recyclable at the end of their life.

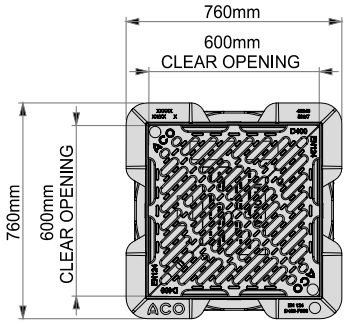
D 400 / F 900 ductile iron slotted cover and frame

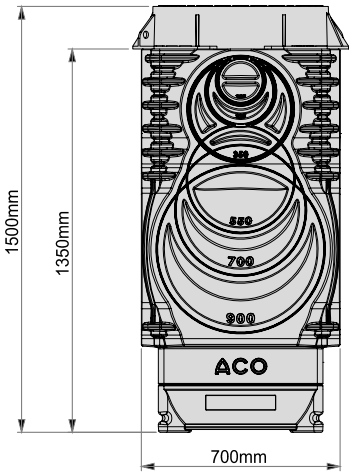


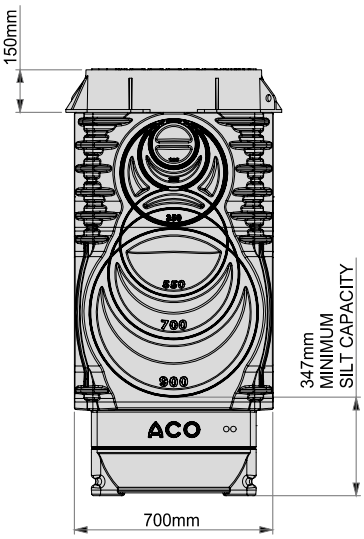
D 400 / F 900 ductile iron solid cover and frame

Qmax access chamber assemblies

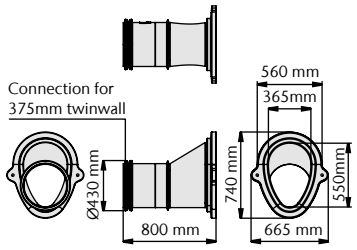
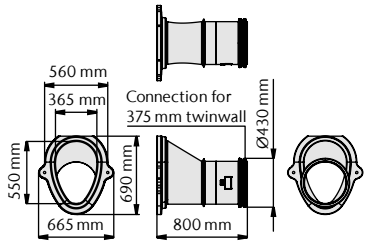
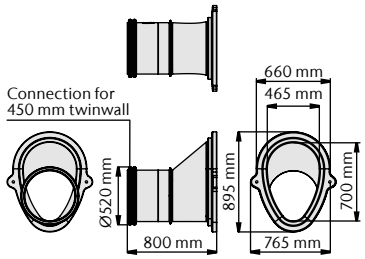
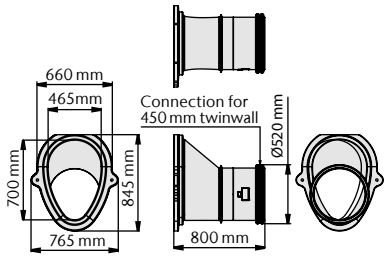
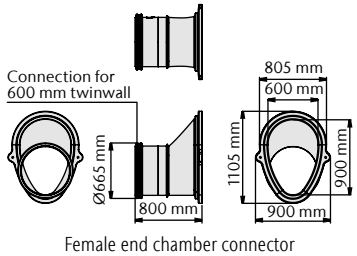
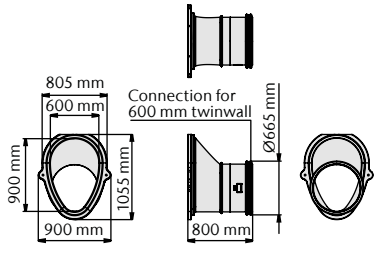
Description	Length	Width	Depth	Weight	Item no.
	[mm]	[mm]	[mm]	[kg]	
Access chamber with D 400 slotted cover and frame	760	760	1500	105	46114
Access chamber with D 400 solid cover and frame	760	760	1500	99	46115
Access chamber with F 900 slotted cover and frame	760	760	1500	130	46116
Access chamber with F 900 solid cover and frame	760	760	1500	117	46117







* These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.

	Description	Weight [kg]	Item no.
 Female end chamber connector	**Qmax 550** **Chamber connector assembly (pair)**	11,8	32826
 Male end chamber connector			
 Female end chamber connector	**Qmax 700** **Chamber connector assembly (pair)**	15,8	32836
 Male end chamber connector			
 Female end chamber connector	**Qmax 900** **Chamber connector assembly (pair)**	25,1	32846
 Male end chamber connector			

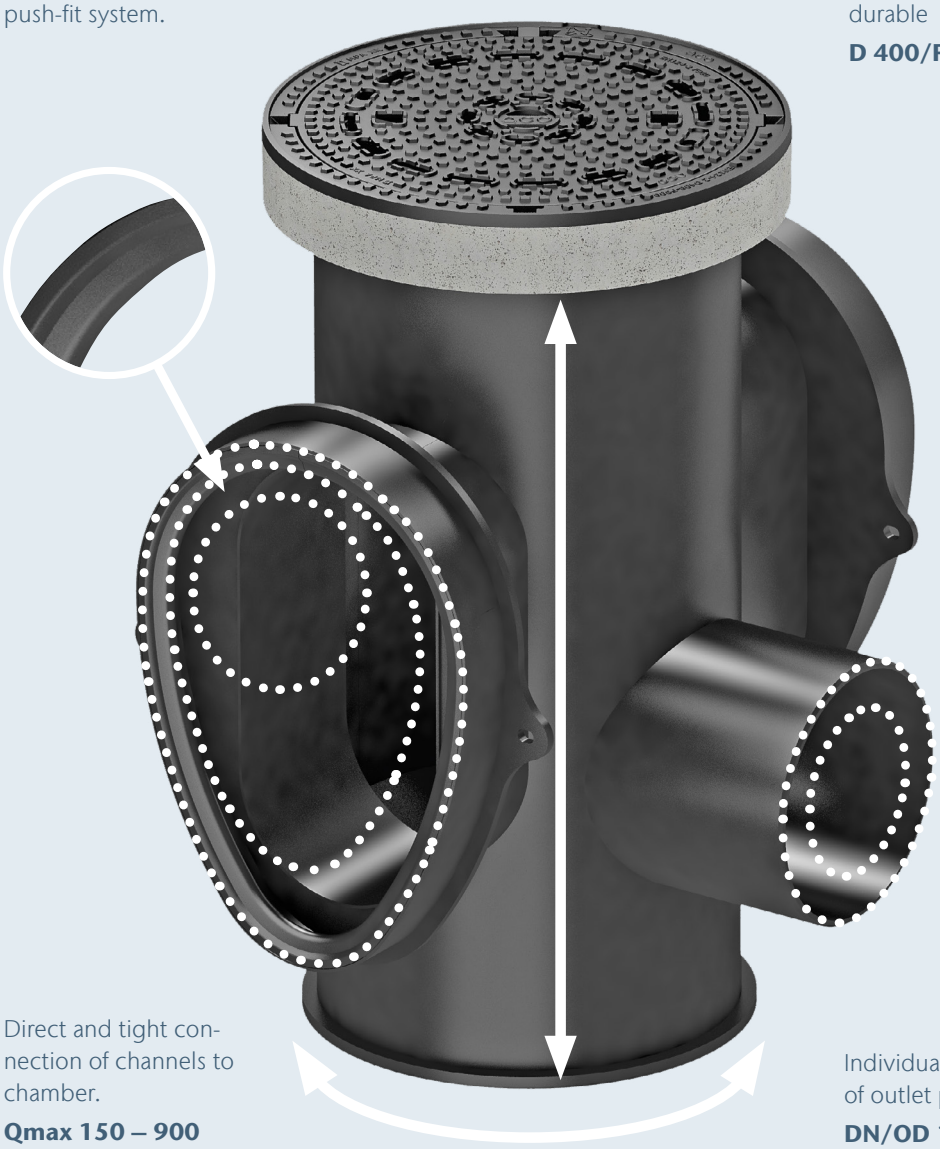
Customized solution

for your project

Sealing already installed into chamber, push-fit system.

Multitop Plus D 400: screwless, silent and durable

D 400/F 900



Direct and tight connection of channels to chamber.

Qmax 150 – 900

Individual diameter of outlet pipe

DN/OD 110 – 500

Individual solution can be configured via ACO product configurator:

- Connection of different nominal sizes
- Position of the integrated connection adapter

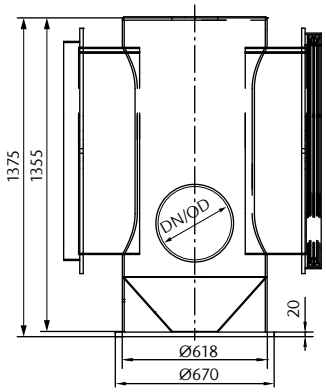
Inlet shaft and inspection shaft for Qmax 150 – 900, LW 600

- Direct and leaktight connection of the channel elements
- Socket including seal
  - NW 150 – 350: Neoprene
  - NW 550 – 900: EPDM
- **Customized solution for your building or project:**
  - Connection of different nominal widths
  - Number and positioning of integrated connection adapters e.g. for corner connections or inlet shafts at the end of the string
  - Individual diameter for pipe connection DN/OD 110 – 500
  - Raised version for channel strings with Q-Road or Q-Slot gully top

Qmax 150 – 350

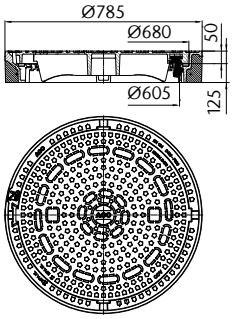
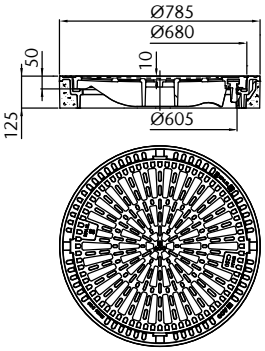
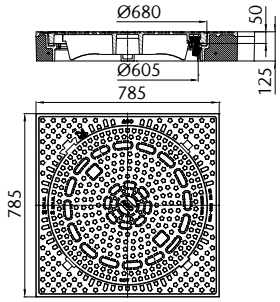
Qmax 150 – 900

Order information

	Dimensions			Outlet pipe DN/OD	Type of channel	Weight	Item no.
	Length	Width	Depth				
	[mm]	[mm]	[mm]			[kg]	
	1070	895	1385	400	Qmax 550	47,2	152107
	1070	895	1385	400	Qmax 700	49,2	152108
	1070	895	1385	400	Qmax 900	51,2	152109

Covers for inlet shafts and inspection shafts with clear width 600

- Clear opening 605 mm
- **Quiet:** PEWEPREN-insert within the frame and on mechanically machined contact areas at cover and frame that prevent rattling
- **Slip resistant:** With non-slip surface independent of installation and direction of travel
- Cover made of ductile iron GJS

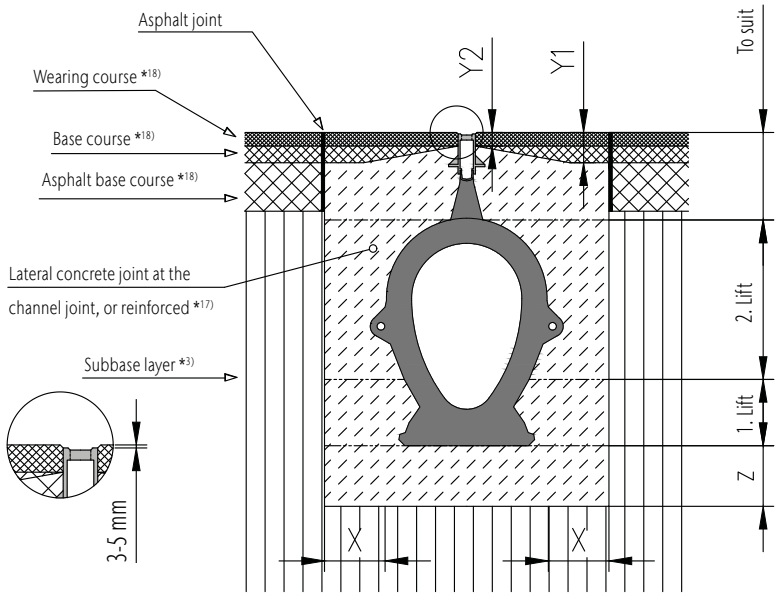
	Dimensions			Material	Load class	Weight	PU	Item no.
	Length [mm]	Width [mm]	Height [mm]			[kg]	[pcs]	
Manhole cover, round								
	785	785	125	Ductile iron	D 400	111,0	10	210510
					F 900	111,0	10	210550
Inlet grating, round								
	785	785	125	Ductile iron	D 400	107,0	10	210611
Manhole cover, angular								
	785	785	125	Ductile iron	D 400	164,0	5	210530
					F 900	164,0	5	210554
Q-Slot cover, angular								
	770	770	128,5	Stainless steel	D 400	85	-	450915
				Galvanised steel	D 400	85	-	450916
				Corten steel	D 400	85	-	450917

Accessories

	Description	Suitable for	Weight [kg]	PU [pcs]	Item number
	**Multifunctional end cap for 150, 225 and 350 systems** ■ For male and female channel end ■ Including neoprene seal	■ Qmax 150	1,0	1	32997
		■ Qmax 225	1,4	1	42221
		■ Qmax 350	2,6	1	42351
	**End cap Qmax 550 – 900 (collar end)** ■ For sleeve end of channel train	■ Qmax 550	10,0	1	418866
		■ Qmax 700	12,5	1	418867
		■ Qmax 900	16,0	1	418868
	**End cap Qmax 550 – 900 (spigot)** ■ For spigot channel train ■ Including EPDM seal	■ Qmax 550	11,0	1	418863
		■ Qmax 700	14,0	1	418864
		■ Qmax 900	18,0	1	418865
	**Transition piece** ■ For nominal width offset ■ Nominal width offset 350/550 executed via inlet shaft	■ Qmax 125 / 225	0,4	1	32995
		■ Qmax 225 / 350	0,8	1	32880
		■ Qmax 550 / 700	2,5	1	32882
		■ Qmax 700 / 900	3,7	1	32883
	**Connecting adapter DN 110** ■ For downpipes (DN/OD 110) ■ In situ installation	■ Qmax 225 a 350	0,2	1	44344
	**Connecting adapter DN 160** ■ For downpipes (DN/OD 160) ■ In situ installation	■ Qmax 550, 700 a 900	0,2	1	44345
	**Protective strips** ■ To cover frames made of ductile iron ■ Magnetic ■ Reusable ■ Roll: □ Length: 15,25 m □ Width: 6,5 cm	■ Ductile iron frame	5,0	1	32854
	**Protective cover strips** ■ To cover the inlet slot ■ PVC, red reflective paint ■ 10 pcs, 1000 mm ■ PVC, red reflective paint	■ Qmax, type Q-Slot rail	0,8	1	446084
	**Lifting out and operating key** ■ Length: 600 mm ■ Galvanised steel	■ Manhole covers Multitop, Civictop, DUROPREN, PEWEPREN ■ Gully tops, Multitop, Aqua Plus, Standard ■ Bridge gullies	1,5	1	600643

Channel installation detail

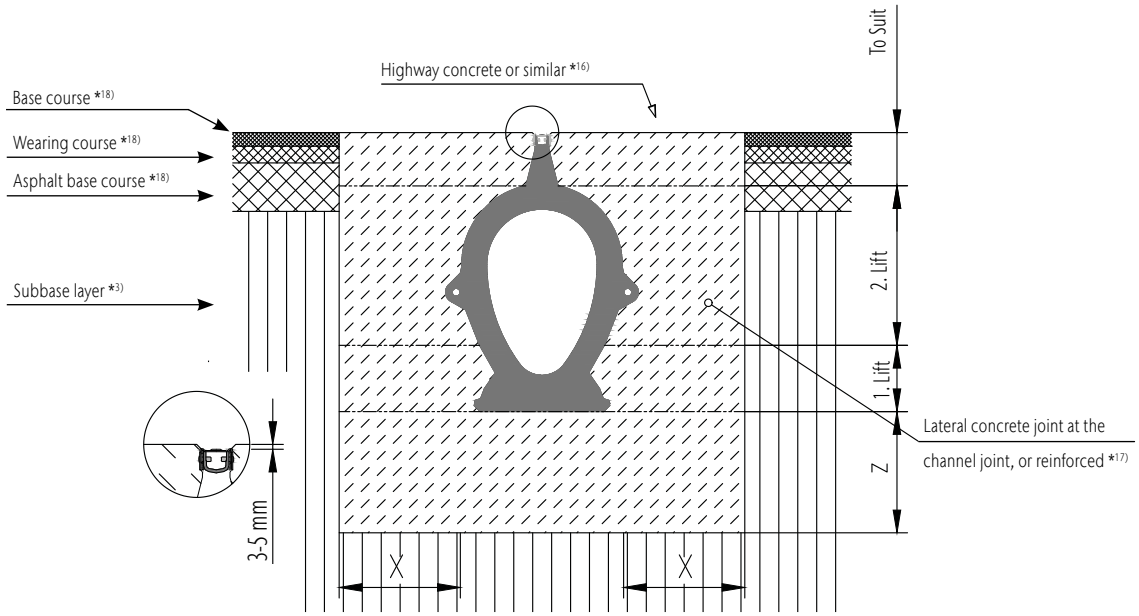
Installation in asphalted areas – A 15 to D 400 (Type: Q-Road)



	Load class	(acc. to DIN EN 1433)	**A 15**	**B 125**	**C 250**	**D 400***	**E 600**	**F 900**
	Concrete quality	(acc. to DIN EN 206-1)	≥ C 20/25	≥ C 20/25	≥ C 20/25	≥ C 20/25		
	Exposure class	(acc. to DIN EN 206-1 Z3)	(X0)	(X0)	(X0)	(X0)		
Qmax 150	Dimensions	X (cm)	≥ 100	≥ 100	≥ 100	≥ 100		
		Y_1 (cm)	≤ 120	≤ 120	≤ 120	≤ 120		
		Y_2 (cm)	≤ 75	≤ 75	≤ 75	≤ 75		
		Z (cm)	≥ 100	≥ 100	≥ 100	≥ 100		
Qmax 225	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
		Y_1 (cm)	≤ 120	≤ 120	≤ 120	≤ 120		
		Y_2 (cm)	≤ 75	≤ 75	≤ 75	≤ 75		
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
Qmax 350	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
		Y_1 (cm)	≤ 120	≤ 120	≤ 120	≤ 120		
		Y_2 (cm)	≤ 75	≤ 75	≤ 75	≤ 75	Project specific, advice on demand	
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
Qmax 550	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
		Y_1 (cm)	≤ 120	≤ 120	≤ 120	≤ 120		
		Y_2 (cm)	≤ 75	≤ 75	≤ 75	≤ 75		
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
Qmax 700	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
		Y_1 (cm)	≤ 120	≤ 120	≤ 120	≤ 120		
		Y_2 (cm)	≤ 75	≤ 75	≤ 75	≤ 75		
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
Qmax 900	Dimensions	X (cm)	≥ 200	≥ 200	≥ 200	≥ 200		
		Y_1 (cm)	≤ 120	≤ 120	≤ 120	≤ 120		
		Y_2 (cm)	≤ 75	≤ 75	≤ 75	≤ 75		
		Z (cm)	≥ 200	≥ 200	≥ 200	≥ 200		

* It is necessary to use concrete C 30/37 for Qmax 900 system
Note: Concreting in layers is necessary from Qmax 550

Installation in asphalted areas – A 15 to F 900 (Type: Q-Flow and Q-Guard)



Channel shortening: 2000 mm long troughs can be shortened to lengths of 400 mm, 1000 mm and 1400 mm.

	Load class	(acc. to DIN EN 1433)	**A 15**	**B 125**	**C 250**	**D 400***	**E 600**	**F 900**
	Concrete quality	(acc. to DIN EN 206-1)	≥ C 20/25	≥ C 20/25	≥ C 20/25	≥ C 20/25	≥ C 30/37	≥ C 30/37
	Exposure class	(acc. to DIN EN 206-1 Z3)	(X0)	(X0)	(X0)	(X0)	(X0)	(X0)
Qmax 150	Dimensions	X (cm)	≥ 100	≥ 100	≥ 100	≥ 100	≥ 150	≥ 200
		Z (cm)	≥ 100	≥ 100	≥ 100	≥ 100	≥ 150	≥ 200
Qmax 225	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200
Qmax 350	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200
Qmax 550	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200	≥ 200
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200	≥ 200
Qmax 700	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200	≥ 200
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200	≥ 200
Qmax 900	Dimensions	X (cm)	≥ 200	≥ 200	≥ 200	≥ 200	≥ 200	≥ 200
		Z (cm)	≥ 200	≥ 200	≥ 200	≥ 200	≥ 200	≥ 200

Installation notes:

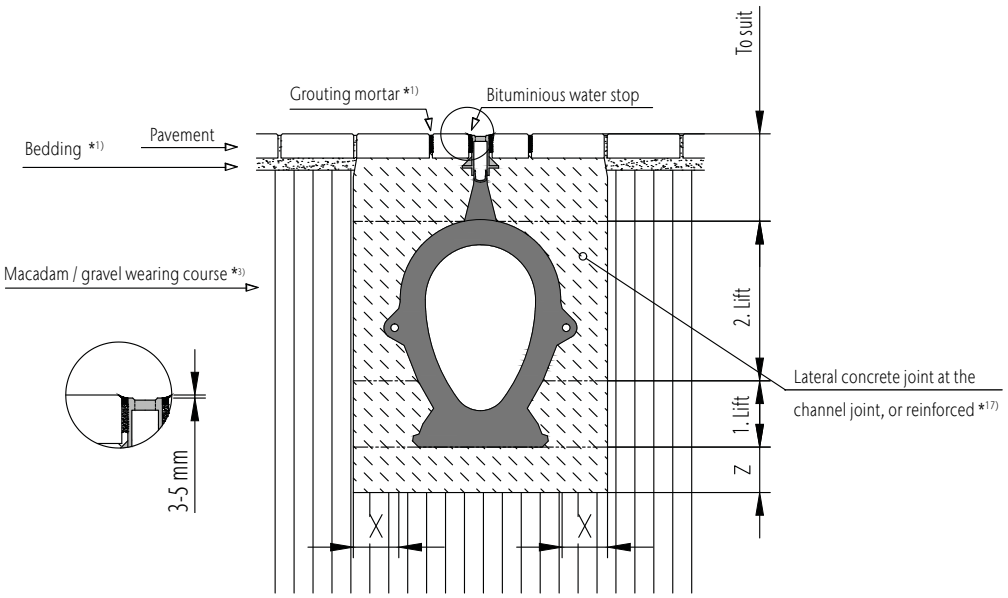
Channel protection: Covering or protecting the rails, before concreting the haunch or laying blocks, removes the time and cost associated with cleaning the channel and grating of cement material and embedded stones. During site work ensure that the plastic protective strip (supplied with the galvanised steel rails) or the ductile iron rail protector (supplied separately) is not damaged or displaced, in order to prevent debris entering the channel during construction. Ensure the rail anchors are well embedded into the concrete.

Reinforcement: The reinforcement required in the concrete surround varies with the installation group (load class) and channel size. For a load class D 400, E 600 & F 900, it may be necessary to reinforce over, under and to the sides of the unit (as indicated).

Concrete surround: Ensure that the channels do not float while pouring the concrete. To prevent flotation or distortion of the 550, 700 and 900 when using high workability concrete, pour concrete in several lifts (e.g. 1 to the line on the side of the channel, 2 to the crown of the channel and 3 to the finished levels). Concrete lifts to 1 and 2 to be 50 mm maximum slump (consistance class S1).

* It is necessary to use concrete C 30/37 for Qmax 900 system
Note: Concreting in layers is necessary from Qmax 550

Installation in paved areas – A 15 to D 400 (Type: Q-Road and Q-Slot)



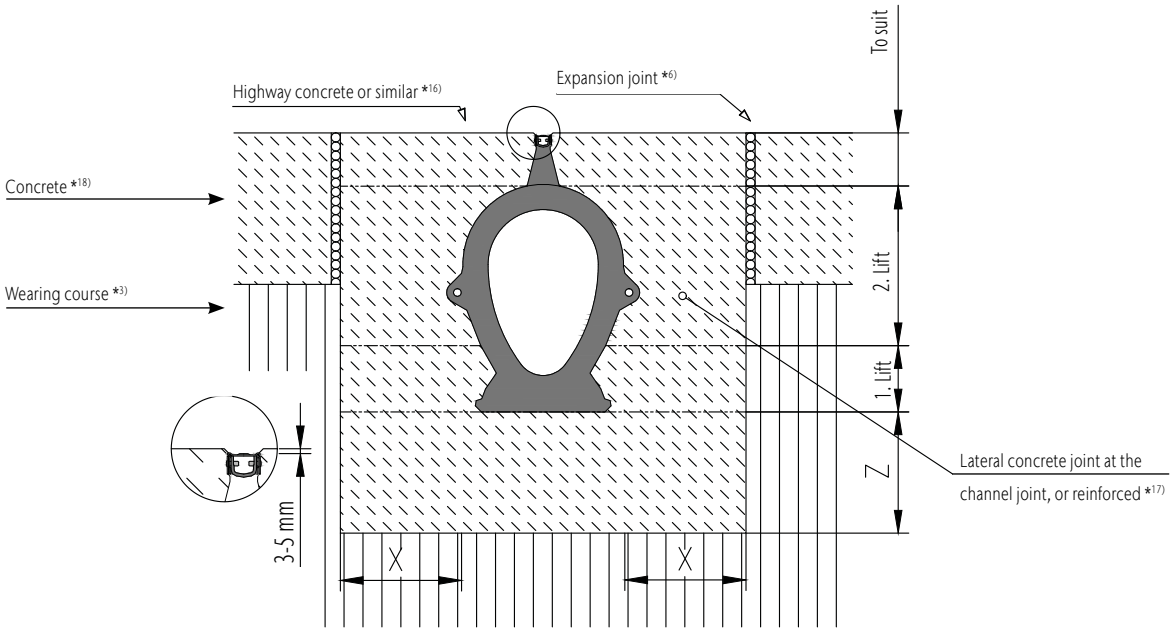
When paving with ACO Qmax with Q-Road and Q-Slot, all paving blocks must be soaked before being placed in fresh wet concrete.
Secure rail and the deposited pavings from unwanted movement.

Channel shortening: 2000 mm long troughs can be shortened to lengths of 400 mm, 1000 mm and 1400 mm.

	Load class	(acc. to DIN EN 1433)	**A 15**	**B 125**	**C 250**	**D 400***	**E 600**	**F 900**
	Concrete quality	(acc. to DIN EN 206-1)	≥ C 20/25	≥ C 20/25	≥ C 20/25	≥ C 20/25		
	Exposure class	(acc. to DIN EN 206-1 Z3)	(X0)	(X0)	(X0)	(X0)		
Qmax 150	Dimensions	X (cm)	≥ 100	≥ 100	≥ 100	≥ 100		
		Z (cm)	≥ 100	≥ 100	≥ 100	≥ 100		
Qmax 225	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
Qmax 350	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150	Project specific, advice on demand	
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
Qmax 550	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
Qmax 700	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150		
Qmax 900	Dimensions	X (cm)	≥ 200	≥ 200	≥ 200	≥ 200		
		Z (cm)	≥ 200	≥ 200	≥ 200	≥ 200		

* It is necessary to use concrete C 30/37 for Qmax 900 system
Note: Concreting in layers is necessary from Qmax 550

Installation in concrete areas – A 15 to F 900



Channel shortening: 2000 mm long troughs can be shortened to lengths of 400 mm, 1000 mm and 1400 mm.

	Load class	(acc. to DIN EN 1433)	**A 15**	**B 125**	**C 250**	**D 400***	**E 600**	**F 900**
	Concrete quality	(acc. to DIN EN 206-1)	≥ C 20/25	≥ C 20/25	≥ C 20/25	≥ C 20/25	≥ C 30/37	≥ C 30/37
	Exposure class	(acc. to DIN EN 206-1 Z3)	(X0)	(X0)	(X0)	(X0)	(X0)	(X0)
Qmax 150	Dimensions	X (cm)	≥ 100	≥ 100	≥ 100	≥ 100	≥ 150	≥ 200
		Z (cm)	≥ 100	≥ 100	≥ 100	≥ 100	≥ 150	≥ 200
Qmax 225	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200
Qmax 350	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200
Qmax 550	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200	≥ 200
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200	≥ 200
Qmax 700	Dimensions	X (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200	≥ 200
		Z (cm)	≥ 150	≥ 150	≥ 150	≥ 150	≥ 200	≥ 200
Qmax 900	Dimensions	X (cm)	≥ 200	≥ 200	≥ 200	≥ 200	≥ 200	≥ 200
		Z (cm)	≥ 200	≥ 200	≥ 200	≥ 200	≥ 200	≥ 200

Installation notes:

Channel protection: Covering or protecting the rails, before concreting the haunch or laying blocks, removes the time and cost associated with cleaning the channel and grating of cement material and embedded stones. During site work ensure that the plastic protective strip (supplied with the galvanised steel rails) or the ductile iron rail protector (supplied separately) is not damaged or displaced, in order to prevent debris entering the channel during construction. Ensure the rail anchors are well embedded into the concrete.

Reinforcement: The reinforcement required in the concrete surround varies with the installation group (load class) and channel size. For a load class D 400, E 600 & F 900, it may be necessary to reinforce over, under and to the sides of the unit (as indicated).

Concrete surround: Ensure that the channels do not float while pouring the concrete. To prevent flotation or distortion of the 550, 700 and 900 when using high workability concrete, pour concrete in several lifts (e.g. 1 to the line on the side of the channel, 2 to the crown of the channel and 3 to the finished levels). Concrete lifts to 1 and 2 to be 50 mm maximum slump (consistance class S1).

* It is necessary to use concrete C 30/37 for Qmax 900 system
Note: Concreting in layers is necessary from Qmax 550

Designing an ACO Qmax® drainage system

The hydraulic capacity of channels accepting flow all along their length can be calculated by the analysis of the differential equations for spatially varied flow, a procedure that requires a computer program such as the proprietary ACO Hydro software, or ACO's new online design software. ACO Design enables users to develop an optimised design of stepped sizes of channels, increasing in size down the run of the channel.

Designing a drainage system
Design of a run of channel drainage requires data on the total drainage catchment area (taken from drawings) and the design rainfall intensity (determined with reference to guidance in EN 752) .

Typical design rainfall intensities depends on local regulations. For large areas, EN 752 should be consulted to determine an appropriate design rainfall. Where the attenuation volume of the large capacity channels is to be analysed, the storage requirements will need to be determined for a range of different storms. ACO can provide channel data for use in proprietary software, such as MicroDrainage WinDes. Please contact ACO Water Management Design Services Team.

ACO Water Management Design Services Team

ACO has embraced the concept of 'value engineering' – an approach to on-site construction that saves both time and money. ACO will review any design to minimise the total scheme and life cost of a proposal. By using ACO Qmax®, it is often possible to remove the need for any conventional underground drainage. For detailed designs using the ACO Hydro software, please contact the ACO Water Management Design Services Team. The team should also be consulted for advice where the inflow is not uniformly distributed along the channel.

The hydraulic performance tables within the relevant sections have been produced from the ACO Hydro software to facilitate a quick manual design method for the determination of the drainage requirements.

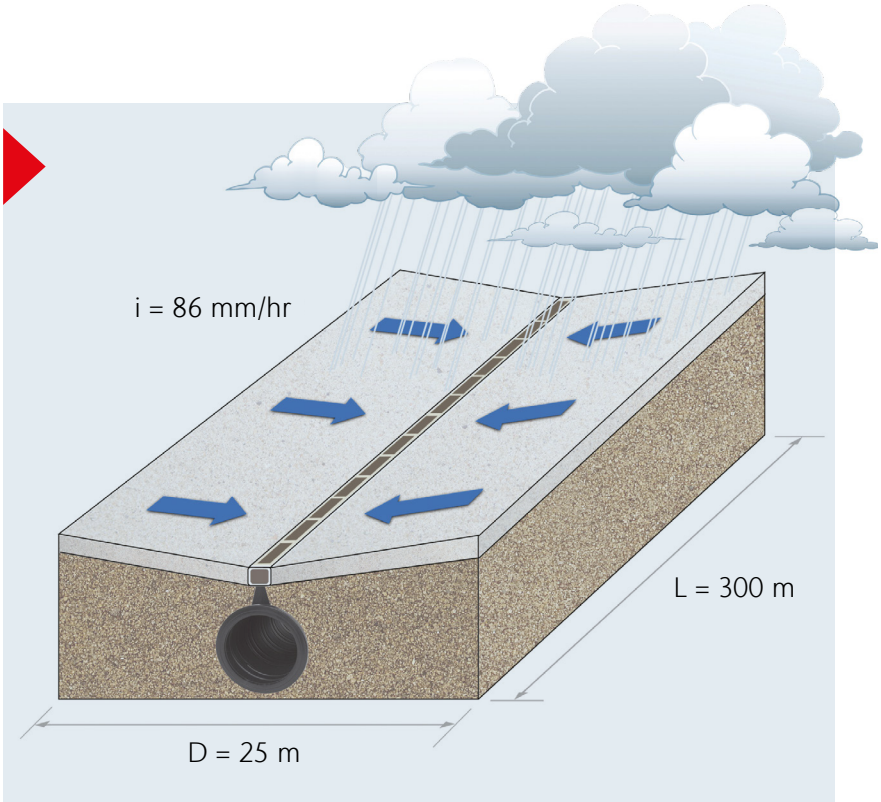
The columns of drainage catchment area (A m^2) are based on a rainfall intensity of 50 mm/h, but can be adapted for use at any rainfall intensity. The columns of maximum flow rate (Q l/s) and maximum lateral inflow (q l/s/m) can be used at any rainfall intensity.

The team is equipped with a new in-house design programme – **ACO Hydraulic Design software** – this unique, highly sophisticated software is built to enable the efficient and accurate hydraulic design of surface water management schemes using channels as the means of conveyance. ACO Hydraulic Design is also available for you to utilise.

Design example

For a design of ACO Qmax®, assume the following figures:

- D = 25 m (depth of catchment area)
- L = 300 m (length of run = length of catchment)
- i = 86 mm/hr (design rainfall intensity)
- Ground slope = 0%



Guidance notes

1/ Determine the area

Area = L x D = 300 x 25 = 7,500 m²

The tables in the respective product chapters give the maximum area that can be drained. However the tables use the standard default rainfall intensity of 50 mm/hr, and this design requires a higher design rainfall of 86 mm/hr. So in order to use the tables to determine the maximum area that can be drained, increase the effective area to, in this case,

7500 x 86/50 = 12,900 m².

From the tables for ACO Qmax® 700 on page 40, for a slope of 0% it can be seen that a 300 m length can drain the required area (it could actually drain 13,200 m2 at 50 mm/hr or 7,675 m2 at 86 mm/h).

2/ Determine the total flow in the channel (Q)

The total flow Q = area x rainfall intensity (and where rainfall intensity is in mm/h, divide by 3600 to adjust the units from hours to seconds).

Q = 300 x 25 x 86 / 3600 = 179 l/s

Again we see from the table that the 300 m run of ACO Qmax® 700 can carry the flow (maximum flow rate from the table is 183 l/s).

3/ Determine the lateral inflow rate (q)

Dividing the total flow by the total channel length gives the rate of lateral inflow into the channel, in l/s per metre run of channel.

q = Q / L

q = 179 / 300 = 0.597 l/s/m

We see from the table that the 300 m run of ACO Qmax® 700 can carry the flow (max lateral flow rate from the table is 0.61 l/s).

The determination of the capacity of the proposed ACO Qmax® channel can be determined from the tables in this brochure in any one of three ways. Using the catchment area is particularly easy when the default rainfall intensity of 50 mm/h is used for design (but can be used at other rainfall intensities as in the example above). Using the total flowrate Q or the lateral inflow q the capacity can be read straight off the tables at any rainfall intensity.

It should be noted that other methods will not give the correct results for channel drainage systems. In particular the use of equations of steady uniform flow, such as Manning's equation, is totally inappropriate for channel drainage design. They will not work at all with level channels and will give grossly inaccurate results at shallow gradients.

Chemical resistance chart

ACO Qmax® is manufactured from MDPE. MDPE has a high resistance to dilute acids and alkalis, and is unaffected by road salt, fuel, oil, deicing agents and other commonly encountered chemicals. Further details of the chemical resistance can be obtained from the ACO Water Management Design Services Team or for particular chemicals, samples of MDPE can be supplied to customers for their own testing. The chemical resistance will also depend on the temperature of the effluent.

The resistance of the gratings and edge rails should also be considered. This chemical resistance chart refers to chemical at ambient temperatures (20°C) and the results are for general guidance only.

Important considerations for chemical environments.

When reviewing potential applications for ACO Qmax® in chemical environments, the following issues should be considered:

- Type(s) & mixture of chemical(s)
- Concentration percentages
- Contact time with drainage system
- Temperatures of chemicals flowing into the drainage system (80°C max)
- Flushing system employed to clear chemicals from the drainage system
- Cleaning agents should be checked for compatibility with channel materials
- ACO material samples can be used for final determination of chemical resistance
- Edge rails, seals, access and silt chamber materials should be checked for chemical resistance

Chemical medium	% conc	Resistance: Medium Density Polyethylene
Acetic acid, glacial	Greater than 96%	YES
Acetic acid	10% - 100%	YES
Acetic anhydride	100%	YES
Acetone	100%	YES
Alum	SOL	YES
Aluminium Sulphate	SAT SOL	YES
Ammonium Chloride	SAT SOL	YES
Ammonium Nitrate	SAT SOL	YES
Ammonium Phosphate	SAT SOL	YES
Ammonium Sulphate	SAT SOL	YES
Aniline (aminobenzene)	100%	YES
Barium Chloride	SAT SOL	YES
Benzaldehyde	100%	YES
Benzene	100%	Limited
Benzyl Alcohol	100%	YES
Borax	SAT SOL	YES
Boric Acid	SAT SOL	YES
Bromine	100%	NO
Bromine Water	100%	NO
Butyl Acetate	100%	YES
Butyric acid	100%	YES
Calcium Carbonate	SAT SOL	YES
Calcium Chloride	SAT SOL	YES
Calcium Hydroxide	SAT SOL	YES
Calcium Nitrate	SAT SOL	YES
Carbon Disulphide	100%	Limited
Carbon Tetrachloride	100%	Limited
Castor Oil	SOL	YES
Chlorine Gas, wet	100%	Limited
Chlorine Water	2% SAT SOL	YES
Chlorobenzene	100%	NO
Chloroform	100%	NO
Chromic Acid	50%	YES
Citric Acid	SAT SOL	YES
Citric Acid	20%	YES
Citric Acid	50%	YES
Copper Chloride	SAT SOL	YES
Copper Nitrate	SAT SOL	YES
Diesel (DERV)	100%	YES
Dimethyl Formamide	100%	YES
Dicotyl Phthalate	100%	YES
Ethanol	40%	YES
Ethanol	96%	YES
Ethyl Acetate	100%	YES
Ethylene Glycol	100%	YES

Model specification clause

The channel drainage system shall be ACO Qmax® supplied by ACO. The channel units shall be fully compliant with EN 1433:2002 with Initial Type Test certification issued by a notified body independent of the manufacturer.

All units shall be of one piece manufacture in Medium Density Polyethylene (MDPE), with metal edge rails attached to the top of the channels.

The standard units shall be installed with the manufacturer's components as required for the scheme. The system shall be installed in accordance with the manufacturer's printed recommendations, and the works carried out as specified on drawings ... ...* and in accordance with recognised good practice.

* Complete as appropriate.

Chemical medium	% conc	Resistance: Medium Density Polyethylene
Ferric Chloride	SAT SOL	YES
Ferrous Chloride	SAT SOL	YES
Ferrous Sulphate	SAT SOL	YES
Formaldehyde	40%	YES
Formic Acid	40%	YES
Fuel Oil	100%	YES
Glycerine	100%	YES
Hydrobromic Acid	100%	YES
Hydrochloric Acid	Concentrate	YES
Petrol	100%	Limited
Potassium Carbonate	SAT SOL	YES
Potassium Chloride	SAT SOL	YES
Potassium Dichromate	SAT SOL	YES
Potassium Hydroxide	10%	YES
Potassium Nitrate	SAT SOL	YES
Potassium Permanganate	20%	YES
Potassium Sulphate	SAT SOL	YES
Pyridine	100%	YES
Sodium Acetate	SAT SOL	NO
Sodium Bromide	SAT SOL	YES
Sodium Carbonate	SAT SOL	YES
Sodium Chlorate	SAT SOL	YES
Sodium Chloride	SAT SOL	YES
Sodium Hydroxide (Caustic Soda)	Concentrate	YES
Sodium Hypochlorite	15%	YES
Sodium Nitrate	SAT SOL	YES
Sodium Nitrite	SAT SOL	YES
Sodium Phosphate	SAT SOL	YES
Sodium Sulphate	SAT SOL	YES
Sodium Sulphide	SAT SOL	YES
Stearic Acid	SAT SOL	YES
Styrene	SOL	Limited
Sulphuric Acid	10%	YES
Sulphuric Acid	50%	YES
Sulphuric Acid	70%	YES
Sulphuric Acid	80%	YES
Sulphuric Acid	98%	YES
Sulphuric Acid	FUMING	NO
Tetrachloroethylene	100%	NO
Thionyl Chloride	100%	NO
Toluene	100%	Limited
Turpentine	100%	Limited
Water	100%	YES
Xylene	100%	Limited
Zinc Sulphate	SAT SOL	YES

Recycled content

ACO aims to incorporate as much recycled material or waste material as is practicable in their manufactured products without compromising performance.

The total recycled content of each product in the ACO Qmax® system will vary as the proportion of the different materials varies due to channel size and edge rail material and type.

The ACO Qmax® products are themselves intended for a long life with low maintenance, to reduce the need to recycle, but when eventually they are no longer needed, their materials can be readily recycled with a very low risk of pollution to the environment.

Conformity

The ACO Qmax® system is CE marked and fully certified to Load Class F 900 EN 1433:2002.

Test certificates and a declaration of performance are available on request. Please contact the ACO Design Team for further information.

EN 1433:2002

Controlling stormwater discharge

If a controlled rate discharge is required, ACO Qmax® can be used in conjunction with the ACO Q-Brake Vortex flow control unit to regulate stormwater flows.

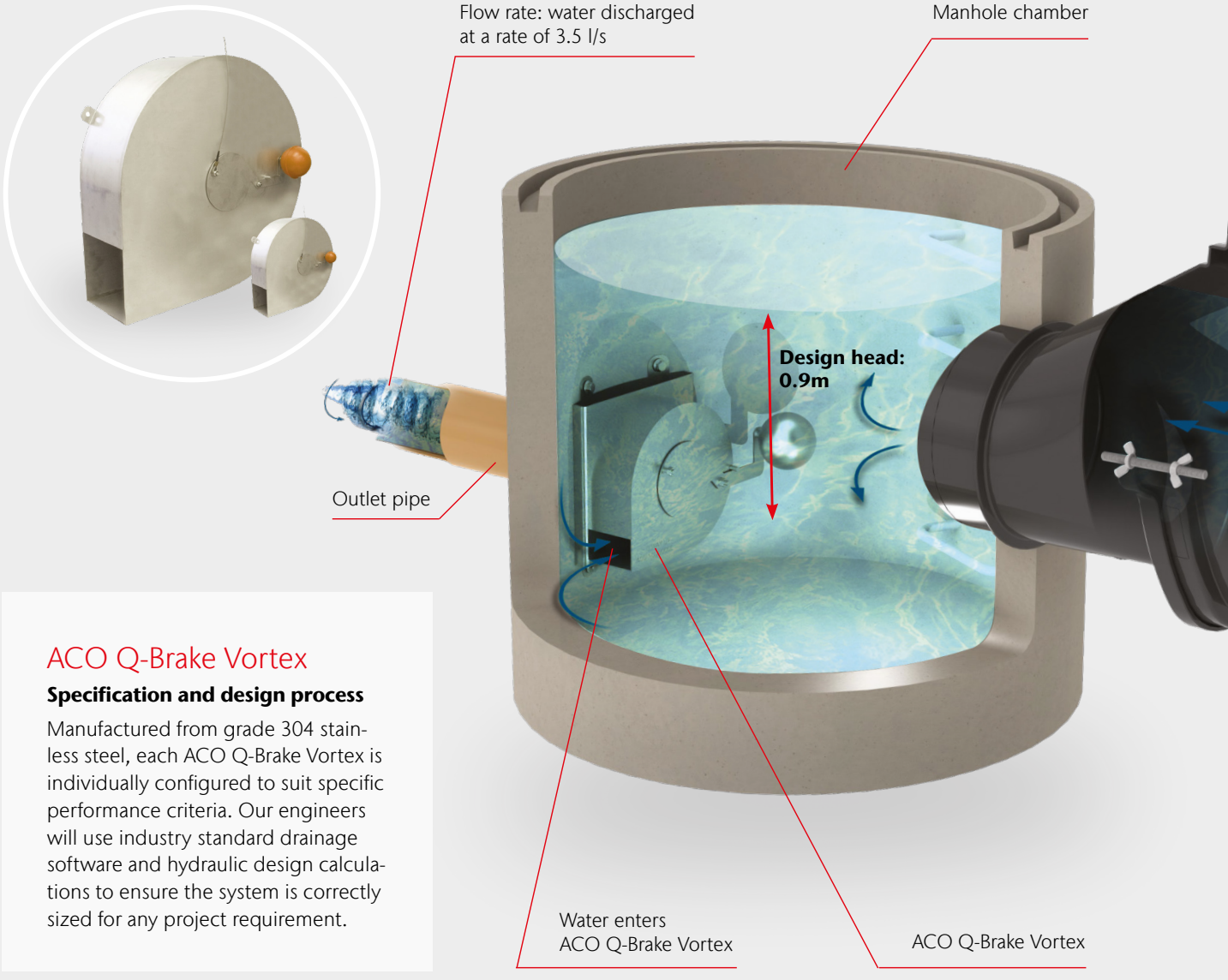
ACO Q-Brake Vortex provides superior hydraulic performance in comparison to traditional flow control systems and permits more flow at lower heads, reducing storage volume requirements and lowering cost.

Compared with more conventional methods e.g. orifice plates or sized pipework, ACO Q-Brake Vortex is less prone to blockage and permits higher flow at a lower head of water, as a vortex flow control allows an outlet orifice 4-6 times larger in crosssectional area to be used.

The installation below simulates how the ACO Qmax® 900 channel system is used to provide surface water drainage, whilst the ACO Q-Brake Vortex is used to regulate the rate of discharge from the development into the watercourse or sewer network.

The benefits of using this stormwater control system are best demonstrated in the example shown on the opposite page.

The conclusion of the example means that upstream storage can be reduced by 10% compared to using a traditional flow control system.



ACO Q-Brake Vortex

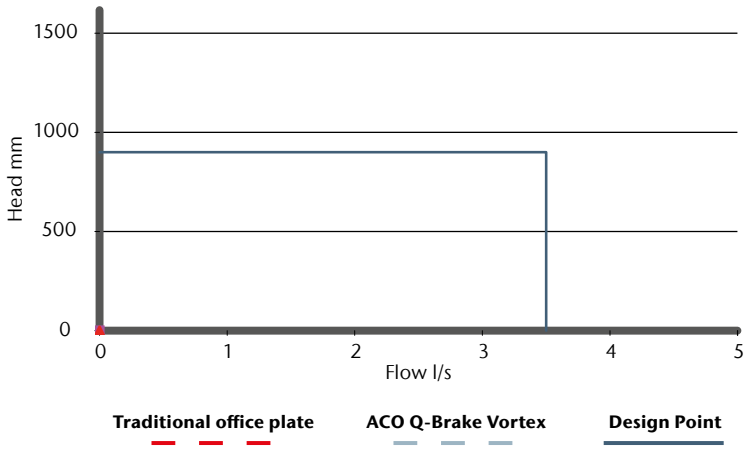
Specification and design process

Manufactured from grade 304 stainless steel, each ACO Q-Brake Vortex is individually configured to suit specific performance criteria. Our engineers will use industry standard drainage software and hydraulic design calculations to ensure the system is correctly sized for any project requirement.

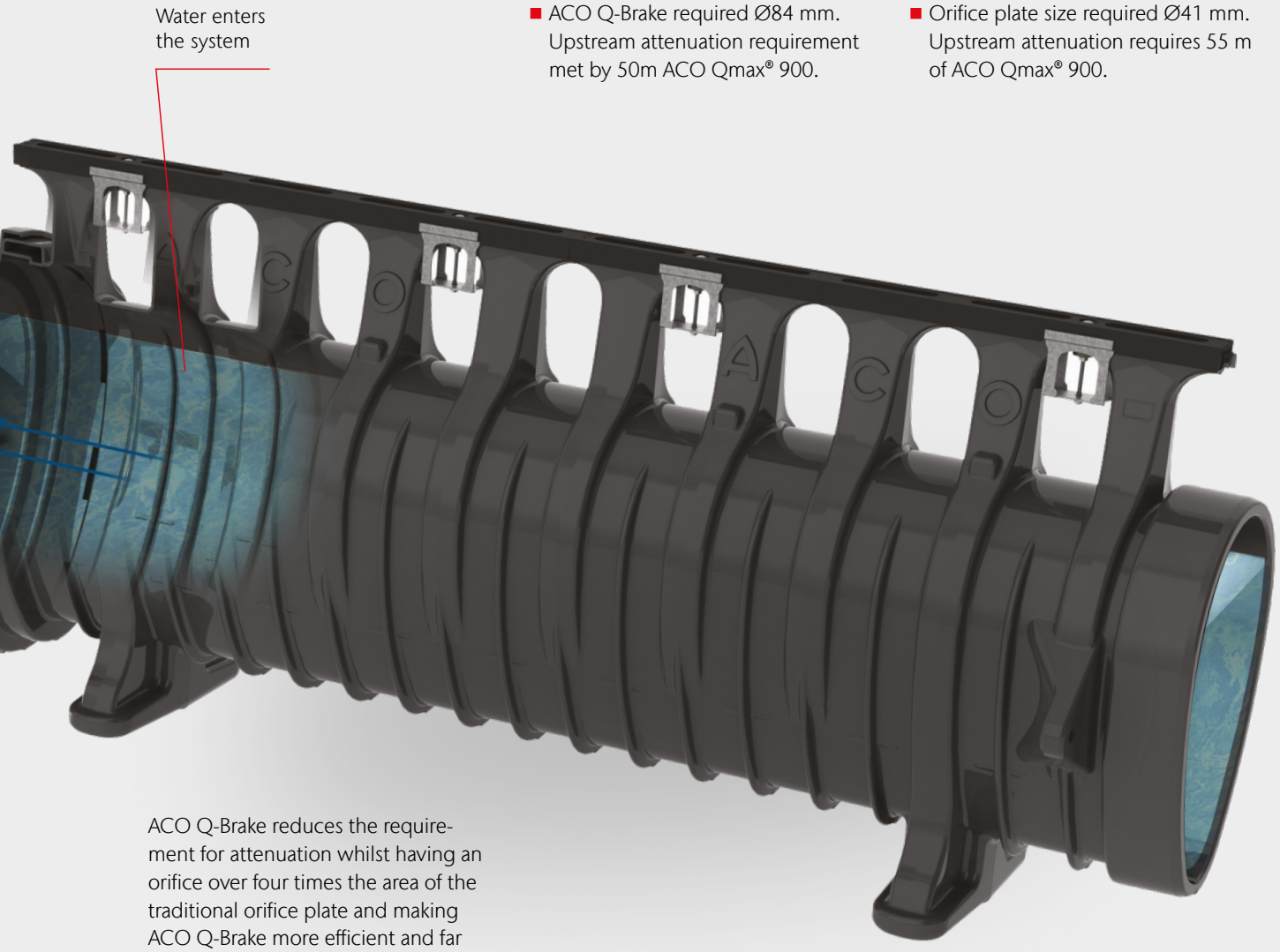
ACO Qmax® channel attenuation storage with a Q-Brake Vortex flow control

Example:
There is a project in Bedford, England with a catchment area of 1200 m². The project has design criteria of a 1 in 30 year storm and the runoff from the site must not exceed 3.5 l/s at a design head of 0.9 m (the height of the ACO Qmax® 900 channel).

Results:
Using drainage software, ACO has compared the upstream storage requirements using ACO Q-Brake and a traditional orifice plate. The results are summarised below:



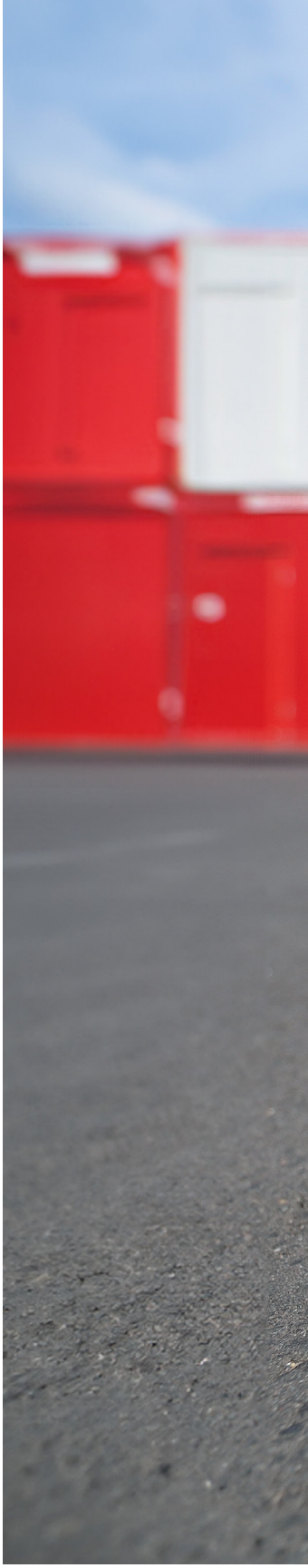
- ACO Q-Brake required Ø84 mm. Upstream attenuation requirement met by 50m ACO Qmax® 900.
- Orifice plate size required Ø41 mm. Upstream attenuation requires 55 m of ACO Qmax® 900.



ACO Q-Brake reduces the requirement for attenuation whilst having an orifice over four times the area of the traditional orifice plate and making ACO Q-Brake more efficient and far less prone to blockage.

Every ACO product supports
the ACO WaterCycle

- Drainage channels
- Road and yard drains
- Gully tops
- Manhole covers
- Rainwater treatment
- Infiltration and attenuation
- Pump shafts
- Flow control systems
- Tree protection
- Amphibian protection



ACO Industries k.s.

Havlíčkova 260
582 22 Přibyslav
Czech Republic

www.swm.aco

ACO. we care for water

Edition 07/2025 – Subject to alterations.