

# Environment










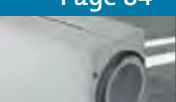




Drainage solutions for areas subject to federal water legislation (WHG)





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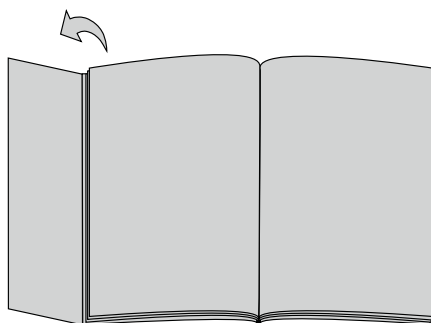
**BIRCOdirect contact**

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# Clarity

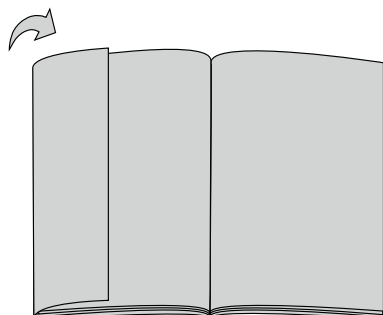
## Unfold to find what you need - Anytime

Unfolding the flaps gives you an overview of the entire BIRCO product range, making comparison and product searches very simple.



## No bookmark necessary

Use the fold-over flap as a practical bookmark. It's always at hand and the fold-over shows you the way straight to the BIRCO product you want to see.



## Heavy Duty

Drainage solutions for heavy load areas

- + BIRCOsir
- + BIRCOsir Point Drainage
- + BIRCOsir Rail Track Drainage
- + BIRCOMassiv
- + BIRCObeany®block
- + BIRCOcanal



## Environment

Drainage solutions for areas subject to federal water legislation (WHG)

- + BIRCOprotect
- + BIRCOsolid grid system
- + BIRCOsolid slot system
- + BIRCOsolid slot channels Pfuhler
- + BIRCODicht



## Landscaping

Drainage solutions for gardening & landscaping construction

- + BIRCOLight
- + BIRCOplus
- + BIRCOslot steel covers
- + BIRCOtop
- + BIRCOprofil



## Design

Attractive drainage solutions for private and commercial properties

- + Cast iron gratings
- + Galvanised metal gratings
- + Stainless steel gratings
- + BIRCOLux



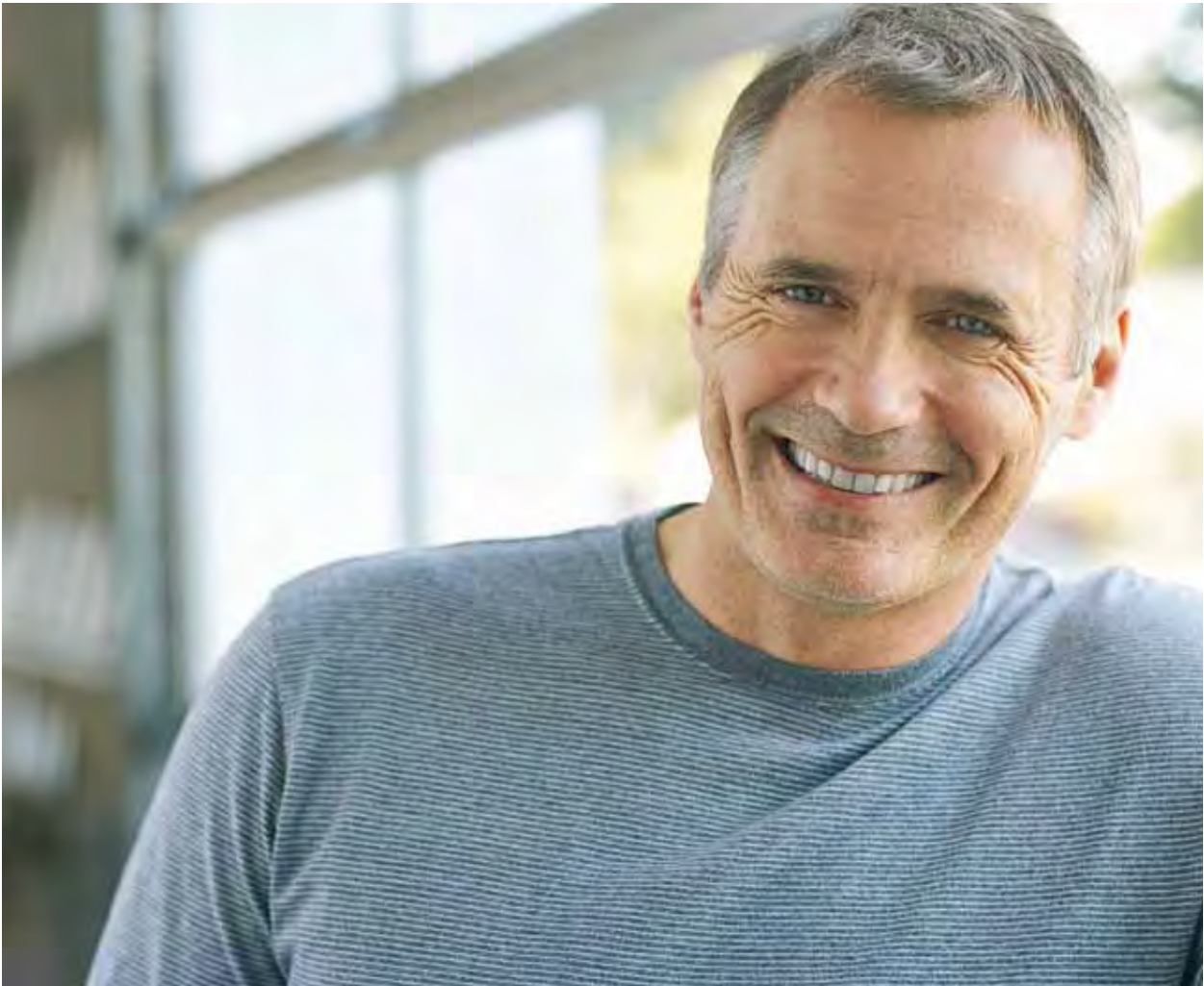
## Project Management

Planning, advice and calculations tailored to your construction project

- + From planning to realisation
- + Individual design
- + Rainwater management
- + Logistics and services



# „Environmentally responsible drainage – a challenge for every planner.”



„In addition to pure precipitation, the industrial sector is particularly vulnerable to the accrual of other liquids in a variety of places which could potentially pose a hazard to groundwater and the environment. This makes skilled planning and conscientious action top priorities, and to get there you need a partner dedicated to technical know-how and quality. In this complex sector, I rely fully on BIRCO.”



# BIRCOquality | System Development

Individual. Reliable. With planning security. As one of the leading manufacturers of channel systems in Europe, BIRCO designs and develops innovative drainage solutions.

## Surface drainage as a comprehensive concept

### Tailored to the specific project

Drainage for spaces and buildings covers a wide spectrum of tasks. Among the first of these is establishing the size and surface properties of the drainage area, its average precipitation and the applicable drainage or seepage possibilities. Afterwards the channel system, nominal width and outfalls are selected.

The detail planning is determined by the anticipated loads, amount of traffic and the peak loads that the concrete body and the covers will have to sustain for years.

Another important factor is the hydraulic performance. Does the site already have a natural slope or should the channels have inbuilt falls? Is line drainage or point drainage the better solution, or even a combination of the two?

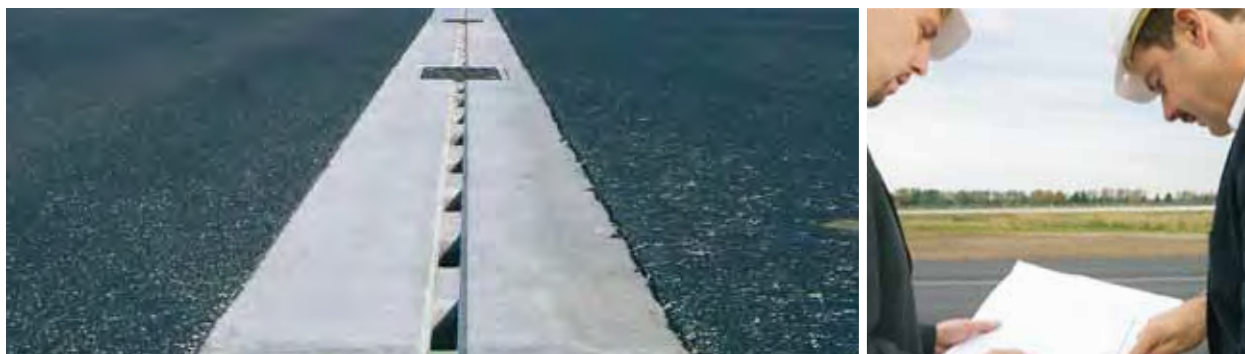
### You receive individual supervision in every phase of the work

In order to ensure its channel systems provide top functionality, BIRCO develops balanced, comprehensive concepts and supervises every stage of the work from planning through to the completed implementation.

### Ecologically consistent

Drainage planning is of particular importance in sectors that are subject to national water legislation. In Germany, the pre-eminent water legislation is the German Federal Water Act (WHG). Agents that are aggressive or hazardous to groundwater have to be collected and drained off separately. BIRCO's environmental experts provide you with skilled, technically informed ecological and legal advice.





BIRCO experts support planners and architects from the first concept through to laying, at the drawing board and every day at the building site.

## Reliable quality in the water safety management sector

### Material properties and processing

Traffic areas and industrial areas where substances posing a hazard to groundwater accumulate along with precipitation represent a special challenge in drainage planning.

In these types of situations, the materials and processing have to be designed to ensure that the concrete body and the corresponding coverings retain their shape along with a tight seal, and that they continue to deliver top performance for years to come. This is the only way to sustainably meet today's environmental responsibilities.

### Planning, realisation and value retention

Channel laying performance, value retention and installation safety are the decisive factors to keep costs and work times under control and to provide long-term investment protection at building sites that are often complex or in multi-stage planning procedures.

BIRCO combines all these qualities in its products and services. Our advice, choice of materials, drainage performance and the advantages you can rely on in laying our drainage facilities form a consistent overall system designed to provide lasting performance and dependable protection against substances that are hazardous to water.

# BIRCOquality | Materials

Environmentally sensible areas require from drainage systems impermeability, resistance to high loads, and reliable hydraulics. BIRCO's use of high quality construction materials ensures the necessary security and long-term investment protection.

## BIRCO concrete channels – Safe even under extreme loads

### Stability and sustainability

BIRCO channels are manufactured from especially pressure-resistant C 40/50 concrete and feature high load reserves, even under extreme usage conditions. The low water-cement ratio ensures top abrasion ratios, proven durability against frost and de-icing salt and a low water-penetration depth. All in all, the side stability of BIRCO drainage channels is up to three times higher than that of conventional, thin-walled construction components.

### WHG-tested PEHD lining

In contrast to conventional materials, PEHD (Polyethylene High Density) is persistently resistant against numerous aggressive agents. Additionally, PEHD's particularly high level of durability makes it possible to compensate for any changes in the ground, for instance settling, without leaks emerging in the channel line. In the channels and outfalls in the BIRCOdicht system, the reinforced concrete channels are lined with PEHD, combining the stability of concrete with the safety and high resistance level of PEHD to aggressive substances. BIRCOdicht and the PEHD materials used are approved by the presiding construction authorities.

## WHG | PEHD

### DIN EN 1433 - Load classes for channels and gratings



**A 15**

Pedestrians, bicyclists, planted areas



**D 400**

Roadways, pedestrian zones, parking lots



**B 125**

Pedestrians, parking lots, delivery vehicles



**E 600**

Industry, military, high wheel loads



**C 250**

Kerbs, road shoulders, parking lots



**F 900**

Aircraft pavements, ports



BIRCO's materials and processing guarantee lasting performance far beyond the 5-year limit.

## Solid steel angles

### 4 mm solid steel – 70 µm galvanised

BIRCO only uses high quality 4 mm solid steel angles with a 70µm zinc coating or angles made of stainless steel. Massive anchors stably connect the angles with the concrete channels. This makes it possible to conduct sealing of the base courses directly at the channel/angles edge when laying BIRCO concrete channels. That creates the optimum connection with the very best de-icing salt and corrosion protection.

4 mm | 70 µm



# BIRCOquality | Manufacture

Drainage systems have to be equipped with long-term protection against displacement and breakage to ensure that no leaks occur. In addition to its high quality materials, BIRCO has developed special processes to guarantee that their systems remain securely sealed for a very long time to come.

## Jointing

### Safety sealing joint in accordance with DIN EN 1433

In order to ensure a permanently stabile connection between the individual channels, all BIRCO concrete channels are fitted with a DIN EN 1433-compliant safety sealing joint.

### Environmentally safe jointing

Creating connection joints on the building site, both in original and subsequent work, can be done smoothly. These joints also increase the level of leak tightness throughout the entire drainage line. BIRCO offers a variety of different systems for sealing the channel systems according to the aggressiveness of the accumulating agents.

- + Jointing with BIRCOplast and PE cord as a flexible two-flank solution (BIRCOsolid, BIRCOprotect)
- + PEHD welding for BIRCODicht

## Concrete in Concrete

### Long-term positional stability

BIRCO offers channel systems categorised as Type I or Type M in accordance with DIN EN 1433. Depending on the type, these systems eliminate the need for load-bearing foundations and/or concrete casings at the building site. This reduces complex, expensive encasing work and ensures positional stability for the long-term.





Individual drainage solutions tailored to the respective construction plan. Cutting to measure precise laying possible at the building site.

## Laying accessories

### Anchor sleeves for smooth laying

The anchor sleeves set into the channel play a valuable role when moving BIRCOsolid grid channels. The corresponding rope eyelets can be used to grip the channel from the outside and move it easily.

### Lifting anchor for precise installation

If the channel units need to fit precisely into a pre-assigned slot, BIRCOsolid can also be supplied fitted with interior lifting anchors, tailored to meet the unique needs of the site. This makes moving easier, reduces digging and makes for better channel laying.

## Individual customisations

### Customised 90° and mitred cuts

BIRCO's factory service offers you a variety of customised channel solutions, either at a 90° angle or mitred. The concrete parts including the covers are cut so that installation at the building site can be conducted faster and with greater precision.

### Horizontal and vertical bore holes

We can fit BIRCO channels with horizontal or vertical bore holes for directly fitting feed and drainage lines according to your plans. The available connections range from DN 70 to DN 300. The diameters are matched with channel base pipes; different pipes are available upon request. Bore holes must be a distance of at least 100 mm away from the end of the channel.

# BIRCOquality | Project Management

BIRCO offers a consultancy and calculation service for planners and architects that supervises every construction plan from its conception through to completion.

## Individual property solutions    Hydraulic calculations

### **Solutions approaches for planners and architects**

Frequently, drainage projects cannot be executed in a standardised fashion. Specific projects can have unique requirements, ranging from the combination of different channel systems to customised pre-cuts and continuing up to specifically designed inbuilt falls and discharge option.

BIRCO's office personnel and sales team experts apply their years of experience in supporting planners and architects. BIRCO's staff work together with them to come up with innovative solutions for surface drainage right from the planning and continuing through to calculation, implementation and execution on the building site.

### **Planning security right from the start**

BIRCO calculates the hydraulic performance of your building project and helps you decide on the drainage whether you order a standard product or an individual solution, you receive plans created with the aid of the latest CAD technology along with complete parts lists of all required accessories, required, as well as laying plans.





Strict material and process testing ensures the functionality and long serviceable life of all BIRCO systems.

## WHG Approval

### Construction authority-certified

Many BIRCO products are certified by the DIBt (German Institute for Civil Engineering) authority in Berlin. This means that they fulfil the strict norms and specifications required for approval to be used with substances posing a hazard for water. This protects the environment while giving you, the planner, verified assurance right from the start.

# DIBt

Center of Competence in Civil Engineering

## Quality management

### Ensuring BIRCO quality

BIRCO tests the materials from its suppliers and its own products regularly with the very latest metrology technology. Testing is conducted by our own quality management experts as well as by external, independent monitoring institutions. To this end, a supervision agreement was concluded with PÜZ Bau, one of the leading German organisations for testing, quality control and certification services for construction products. Consistent testing plans allow us to register all of the relevant data and compose comprehensible test reports.

### From the material up to the finished product

We inspect all goods received for the stipulated quality characteristics, we conduct initial sample testing (documented in a corresponding report) and we monitor product quality continuously throughout the production process. In this way, our own production processes as well as those of our suppliers are under constant surveillance. All of this results in a quality standard that you can rely on.

## Certification

### Confirmed quality and processes

Our seamless quality control means that BIRCO products not only comply with the required DIN standards, but are also certified by a variety of construction supervisory authorities. This is a standard that we are proud of and that we are working oneach day to improve even more

In addition, BIRCO maintains an integrated management system (IMS) consisting of quality management in accordance with DIN EN ISO 9001:2008, environmental management in accordance with DIN EN ISO 14001 and in accordance with EWG 1836/93, and a management system for work safety and workplace safety in accordance with OHRIS guidelines.

# BIRCOproduct system |

## For the environmental sector



Lasting protection from extreme loads and aggressive agents.





# BIRCOprotect | Safe groundwater protection even with heavy loads

BIRCOprotect's officially certified sealing concept provides reliable groundwater protection that can bear up to even the heaviest loads. With 5 different nominal widths and a matching outfall system, we can resolve even the most difficult drainage situations flexibly and affordably.

+ A 15 to F900



+ WHG Certificate  
No. Z-74.4-34





For everywhere subject to heavy traffic where substances hazardous to water such as fuels, mild lye and acids accrue.

## BIRCOprotect | Areas of application

- + Container hubs
- + Heavy-duty load areas
- + Storage, filling and transferring facilities for water-hazardous substances/Areas subject to water legislation
- + Petrol stations
- + Wastewater treatment plants



**BIRCOprotect | Facts**

- + Channel system: NW 100 – 400 (NW 500 on demand)  
with and without inbuilt falls
- + Officially certified (No. Z-74.4-34)
- + Construction lengths: 0.5, 1.0, 2.0 metres
- + Load class: A 15 – F 900
- + Outfall units in every nominal width with outstanding drainage performance
- + Shut-off outfall units (not certified)
- + Broad range of gratings



# BIRCOprotect |

## Safe groundwater protection even with heavy loads

BIRCOprotect combines top drainage performance and high storage volume with efficient groundwater protection under the heaviest loads.

**i Optimum drainage**

- + High storage volume with a stabile seal.
- + Fast drainage via built falls.

**Corrosion protection**

- + Stability and corrosion protection: 4 mm solid steel angled with a 70 µm zinc coating anchored in concrete.

**Material quality**

- + High quality C 40/50 concrete
- + High level of compressive strength and resistance to frost and de-icing salt ensure a long service life and safeguard your investment.
- + Resistant to mineral oils and petrol varieties.

**Traffic safety**

- + High level of traffic safety thanks to the 4 or 8 bolt connections per metre. Connection options: Easylock or individually threaded.

**Safety concept**

- + Sealing joint can be visually inspected.
- + 2-flank adhesion of the sealing joint guarantees top elasticity.
- + Officially certified (No. Z-74.4-34)

**i Individually applicable**

- + The 5 different nominal widths that can be combined with one another and the matching outfalls open up a broad range of application possibilities.

## Nordzucker Klein Wanzleben – Combined line



This high-tech production facility creates ethanol from beets. BIRCO comprehensively fitted the facility with various nominal widths of BIRCOprotect, reliable BIRCOcanal

supply channels and 6 monitored sump wells connected to the BIRCOprotect channel system.

## CSC JÄCKLECHEMIE, Nuremberg – Reliable storage area



The CSC JÄCKLECHEMIE chemical operation in Nuremberg supplies its clients with a broad range of products and functions as a reliable storage and transport spot for substances, some of which are hazardous for water. The storage area and the industrial site are protected with a drainage system comprised of BIRCOdicht and BIRCOprotect.

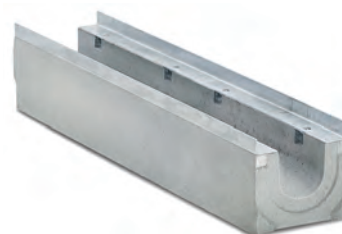
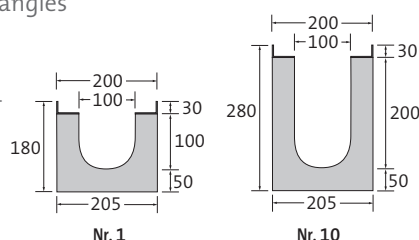


# BIRCOprotect | NW 100

Safe groundwater protection even with heavy loads

## Channel elements | 1% internal inbuilt fall

- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint



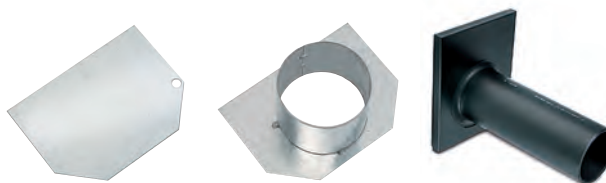
Description	Length	Width at top/ at ground	Height at groove/tongue	Weight	Load class DIN EN 1433	Article No.
Channel No. 1	1000 mm	200/205 mm	180/190 mm	57.3 kg	A 15 – F 900	042001
Channel No. 2	1000 mm	200/205 mm	190/200 mm	57.0 kg	A 15 – F 900	042002
Channel No. 3	1000 mm	200/205 mm	200/210 mm	61.0 kg	A 15 – F 900	042003
Channel No. 4	1000 mm	200/205 mm	210/220 mm	64.3 kg	A 15 – F 900	042004
Channel No. 5	1000 mm	200/205 mm	220/230 mm	66.3 kg	A 15 – F 900	042005
Channel No. 6	1000 mm	200/205 mm	230/240 mm	68.3 kg	A 15 – F 900	042006
Channel No. 7	1000 mm	200/205 mm	240/250 mm	70.3 kg	A 15 – F 900	042007
Channel No. 8	1000 mm	200/205 mm	250/260 mm	74.3 kg	A 15 – F 900	042008
Channel No. 9	1000 mm	200/205 mm	260/270 mm	76.8 kg	A 15 – F 900	042009
Channel No. 10	1000 mm	200/205 mm	270/280 mm	76.3 kg	A 15 – F 900	042010

## Channel elements | without internal inbuilt fall

- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint

Description	Length	Width at top/ at ground	Height at groove/tongue	Weight	Load class DIN EN 1433	Article No.
Channel No. 0/0	500 mm	200/205 mm	180/180 mm	30.7 kg	A 15 – F 900	042031
Channel No. 0/0	1000 mm	200/205 mm	180/180 mm	56.3 kg	A 15 – F 900	042026
Channel No. 5/0	1000 mm	200/205 mm	230/230 mm	67.3 kg	A 15 – F 900	042027
Channel No. 10/0	1000 mm	200/205 mm	280/280 mm	77.3 kg	A 15 – F 900	042028

## End caps

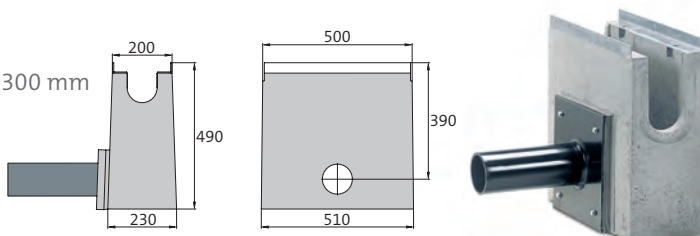


Description	Width	For construction height	Weight	Article No.
End cap, galvanised, No. 0/0 – 3	200 mm	180 – 210 mm	0.5 kg	042090
End cap, galvanised, No. 4 – 7	200 mm	210 – 250 mm	0.6 kg	042091
End cap, galvanised, No. 8 – 10	200 mm	250 – 280 mm	0.7 kg	042092
End cap with outlet DN 100, galvanised, No. 0/0	200 mm	180 mm	0.7 kg	042045
End cap with outlet DN 100, galvanised, No. 5/0	200 mm	230 mm	0.9 kg	042046
End cap with outlet DN 100, galvanised, No. 10/0	200 mm	280 mm	1.1 kg	042047
End cap with outlet DA 110 x 6.3 - SDR 17, PEHD, No. 0/0, length 300 mm	200 mm	180 mm	2.3 kg	044006
End cap with outlet DA 110 x 6.3 - SDR 17, PEHD, No. 5/0, length 300 mm	200 mm	230 mm	2.7 kg	044007
End cap with outlet DA 110 x 6.3 - SDR 17, PEHD, No. 10/0, length 300 mm	200 mm	280 mm	3.1 kg	044008

Galvanised end caps also available in stainless steel.

## In-line outfall unit | with PEHD pipe support | 1-piece

- + 1- or 2-sided channel connection
- + PP-silt bucket (also galvanised)
- + PEHD pipe support DA 110x6.3 - SDR 17, length 300 mm
- + Lateral drainage connection
- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint
- + Other outlets on request

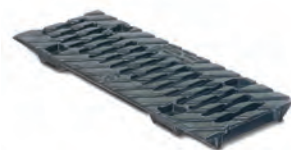


Description	Length	Width at top/ at ground	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit No. 0/0	500 mm	200/230 mm	490 mm	73.1 kg	A 15 – F 900	044003
In-line outfall unit No. 5/0	500 mm	200/230 mm	490 mm	73.1 kg	A 15 – F 900	044004
In-line outfall unit No. 10/0	500 mm	200/230 mm	490 mm	73.1 kg	A 15 – F 900	044005

Exception up to D 400: Not for use across the carriage- way of highways or motorways.

### Cast slotted gratings

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection
- + 8 point per metre Easylock-fastening (alternatively)



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	187 mm	30 mm	5.2 kg	SW 100/13 mm	469 cm <sup>2</sup> /m	A 15 – C 250	140072/e
black	500 mm	187 mm	30 mm	6.4 kg	SW 100/13 mm	469 cm <sup>2</sup> /m	A 15 – E 600	140075/e
galvanised	500 mm	187 mm	30 mm	6.4 kg	SW 100/13 mm	469 cm <sup>2</sup> /m	A 15 – E 600	140075v/ve
black	500 mm	187 mm	30 mm	7.6 kg	SW 100/13 mm	469 cm <sup>2</sup> /m	A 15 – F 900	140078

### Mesh gratings | cast

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection
- + 8 point per metre Easylock-fastening (alternatively)



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	187 mm	30 mm	7.2 kg	MW 20/30 mm	876 cm <sup>2</sup> /m	A 15 – E 600	140086/e
galvanised	500 mm	187 mm	30 mm	7.2 kg	MW 20/30 mm	876 cm <sup>2</sup> /m	A 15 – E 600	140086v/ve

Article No. with v = galvanised, article No. with e = with Easylock, SW = slot width, MW = mesh width  
Exception up to D 400: Not for use across the carriage-way of highways or motorways.

### Mesh gratings

- + Hot-dipped galvanised
- + 4-point per grating M12/A2 bolt connection
- + 4-point per grating Easylock-fastening (alternatively)
- + On request also available in stainless steel (V2A, without Easylock)



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
hot-dipped galvanised	500 mm	187 mm	30 mm	2.8 kg	MW 30/30 mm	1334 cm <sup>2</sup> /m	A 15 – C 250	140062/e
hot-dipped galvanised	1000 mm	187 mm	30 mm	5.6 kg	MW 30/30 mm	1334 cm <sup>2</sup> /m	A 15 – C 250	140052/e
hot-dipped galvanised	500 mm	187 mm	30 mm	3.5 kg	MW 30/12 mm	1154 cm <sup>2</sup> /m	A 15 – C 250	140063/e
hot-dipped galvanised	1000 mm	187 mm	30 mm	6.3 kg	MW 30/12 mm	1154 cm <sup>2</sup> /m	A 15 – C 250	140053/e
hot-dipped galvanised	500 mm	187 mm	30 mm	5.0 kg	MW 20/30 mm	1140 cm <sup>2</sup> /m	A 15 – E 600	140064/e
hot-dipped galvanised	1000 mm	187 mm	30 mm	9.5 kg	MW 20/30 mm	1140 cm <sup>2</sup> /m	A 15 – E 600	140054/e
hot-dipped galvanised	500 mm	187 mm	30 mm	5.8 kg	MW 20/12 mm	1019 cm <sup>2</sup> /m	A 15 – E 600	140065/e
hot-dipped galvanised	1000 mm	187 mm	30 mm	10.9 kg	MW 20/12 mm	1019 cm <sup>2</sup> /m	A 15 – E 600	140055/e

### BIRCOprotect | PEHD

- + PEHD (Polyethylen High Density) is continuously resistant against many aggressive media. Pipe supports and end caps in PEHD are available for BIRCOprotect.

Article No. with e = with Easylock, MW = mesh width  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

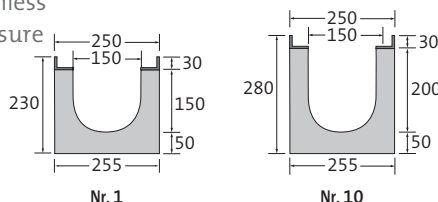


# BIRCOprotect | NW 150

Safe groundwater protection even with heavy loads

## Channel elements | 0.5% internal inbuilt fall

- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint



Description	Length	Width at top/ at ground	Height at groove/tongue	Weight	Load class DIN EN 1433	Article No.
Channel No. 1	1000 mm	250/255 mm	230/235 mm	77.3 kg	A 15 – F 900	042101
Channel No. 2	1000 mm	250/255 mm	235/240 mm	78.3 kg	A 15 – F 900	042102
Channel No. 3	1000 mm	250/255 mm	240/245 mm	79.3 kg	A 15 – F 900	042103
Channel No. 4	1000 mm	250/255 mm	245/250 mm	80.3 kg	A 15 – F 900	042104
Channel No. 5	1000 mm	250/255 mm	250/255 mm	81.3 kg	A 15 – F 900	042105
Channel No. 6	1000 mm	250/255 mm	255/260 mm	82.3 kg	A 15 – F 900	042106
Channel No. 7	1000 mm	250/255 mm	260/265 mm	83.3 kg	A 15 – F 900	042107
Channel No. 8	1000 mm	250/255 mm	265/270 mm	84.3 kg	A 15 – F 900	042108
Channel No. 9	1000 mm	250/255 mm	270/275 mm	85.3 kg	A 15 – F 900	042109
Channel No. 10	1000 mm	250/255 mm	275/280 mm	86.3 kg	A 15 – F 900	042110

## Channel elements | without internal inbuilt fall

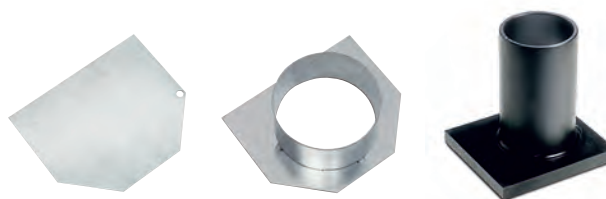
- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint

Description	Length	Width at top/ at ground	Height at groove/tongue	Weight	Load class DIN EN 1433	Article No.
Channel No. 0/0	500 mm	250/255 mm	230/230 mm	40.2 kg	A 15 – F 900	042131
Channel No. 0/0	1000 mm	250/255 mm	230/230 mm	75.3 kg	A 15 – F 900	042126
Channel No. 5/0	1000 mm	250/255 mm	255/255 mm	81.3 kg	A 15 – F 900	042127
Channel No. 10/0	1000 mm	250/255 mm	280/280 mm	87.3 kg	A 15 – F 900	042128

Exception up to D 400: Not for use across the carriage-way of highways or motorways.



## End caps

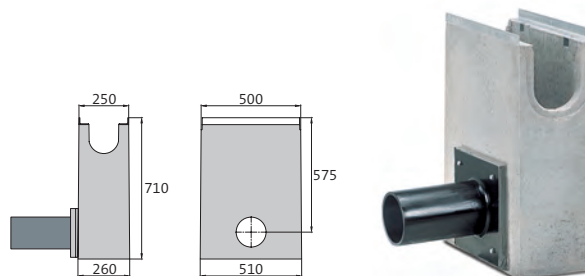


Description	Width	For construction height	Weight	Article No.
End cap, galvanised, No. 0/0 – 4	250 mm	230 – 250 mm	0.8 kg	042190
End cap, galvanised, No. 5 – 7	250 mm	250 – 270 mm	0.8 kg	042191
End cap, galvanised, No. 8 – 10	250 mm	270 – 280 mm	0.8 kg	042192
End cap with outlet DN 150, galvanised, No. 0/0	250 mm	230 mm	1.2 kg	042145
End cap with outlet DN 150, galvanised, No. 5/0	250 mm	255 mm	1.3 kg	042146
End cap with outlet DN 150, galvanised, No. 10/0	250 mm	280 mm	1.3 kg	042147
End cap with outlet DA 160 x 9.1 - SDR 17, PEHD, No. 0/0, Length 300 mm	250 mm	230 mm	2.6 kg	044106
End cap with outlet DA 160 x 9.1 - SDR 17, PEHD, No. 5/0, Length 300 mm	250 mm	255 mm	2.7 kg	044107
End cap with outlet DA 160 x 9.1 - SDR 17, PEHD, No. 10/0, Length 300 mm	250 mm	280 mm	2.8 kg	044108

Galvanised end caps also available in stainless steel.

## In-line outfall unit | with PEHD pipe support | 1-piece

- + 1- or 2-sided channel connection
- + PP-silt bucket (also galvanised)
- + PEHD pipe support DA 160x9.1 - SDR 17.6, length 300 mm
- + Lateral drainage connection
- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/ V4A, combi-closure system not in stainless steel)
- + Visible sealing joint
- + Other outlets on request

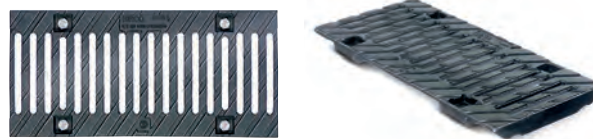


Description	Length	Width at top/ at ground	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit No. 0/0	500 mm	250/260 mm	710 mm	114.0 kg	A 15 – F 900	044103
In-line outfall unit No. 5/0	500 mm	250/260 mm	710 mm	114.0 kg	A 15 – F 900	044104
In-line outfall unit No. 10/0	500 mm	250/260 mm	710 mm	114.0 kg	A 15 – F 900	044105

Exception up to D 400: Not for use across the carriage- way of highways or motorways.

### Cast slotted gratings

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection
- + 8 point per metre Easylock-fastening (alternatively)



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	237 mm	30 mm	8.8 kg	SW 150/12 mm	644 cm <sup>2</sup> /m	A 15 – C 250	140172/e
black	500 mm	237 mm	30 mm	10.7 kg	SW 150/12 mm	644 cm <sup>2</sup> /m	A 15 – E 600	140175/e
galvanised	500 mm	237 mm	30 mm	10.2 kg	SW 150/12 mm	644 cm <sup>2</sup> /m	A 15 – E 600	140175v/ve
black	500 mm	237 mm	30 mm	12.4 kg	SW 150/12 mm	644 cm <sup>2</sup> /m	A 15 – F 900	140178

### Mesh gratings | cast

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection
- + 8 point per metre Easylock-fastening (alternatively)



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	237 mm	30 mm	11.2 kg	MW 20/30 mm	1110 cm <sup>2</sup> /m	A 15 – E 600	140186/e
galvanised	500 mm	237 mm	30 mm	11.2 kg	MW 20/30 mm	1110 cm <sup>2</sup> /m	A 15 – E 600	140186v/ve

### Honeycomb gratings | cast

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection
- + 8 point per metre Easylock-fastening (alternatively)



Description	Length	Width	Höhe	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	237 mm	30 mm	7.6 kg	MW 24/59 mm	1396 cm <sup>2</sup> /m	A 15 – E 600	140179/e
galvanised	500 mm	237 mm	30 mm	7.6 kg	MW 24/59 mm	1396 cm <sup>2</sup> /m	A 15 – E 600	140179v/ve

Article No. with v = galvanised, article No. with e = with Easylock, SW = slot width, MW = mesh width  
Exception up to D 400: Not for use across the carriage-way of highways or motorways.

### Mesh gratings

- + Hot-dipped galvanised
- + 4-point per grating M12/A2 bolt connection
- + 4-point per grating Easylock-fastening (alternatively)
- + On request also available in stainless steel (V2A, without Easylock)



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
hot-dipped galvanised	500 mm	237 mm	30 mm	3.8 kg	MW 30/30 mm	1285 cm <sup>2</sup> /m	A 15 – C 250	140162/e
hot-dipped galvanised	1000 mm	237 mm	30 mm	7.1 kg	MW 30/30 mm	1285 cm <sup>2</sup> /m	A 15 – C 250	140152/e
hot-dipped galvanised	500 mm	237 mm	30 mm	4.4 kg	MW 30/15 mm	1185 cm <sup>2</sup> /m	A 15 – C 250	140163/e
hot-dipped galvanised	1000 mm	237 mm	30 mm	8.3 kg	MW 30/15 mm	1185 cm <sup>2</sup> /m	A 15 – C 250	140153/e
hot-dipped galvanised	500 mm	237 mm	30 mm	7.5 kg	MW 20/30 mm	1088 cm <sup>2</sup> /m	A 15 – E 600	140164/e
hot-dipped galvanised	1000 mm	237 mm	30 mm	14.5 kg	MW 20/30 mm	1088 cm <sup>2</sup> /m	A 15 – E 600	140154/e
hot-dipped galvanised	500 mm	237 mm	30 mm	8.4 kg	MW 20/12 mm	888 cm <sup>2</sup> /m	A 15 – E 600	140165/e
hot-dipped galvanised	1000 mm	237 mm	30 mm	16.5 kg	MW 20/12 mm	888 cm <sup>2</sup> /m	A 15 – E 600	140155/e

### BIRCOprotect | PEHD

- + PEHD (Polyethylen High Density) is continuously resistant against many aggressive media. Pipe supports and end caps in PEHD are available for BIRCOprotect.

Article No. with v = galvanised, article No. with e = with Easylock, MW = mesh width  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

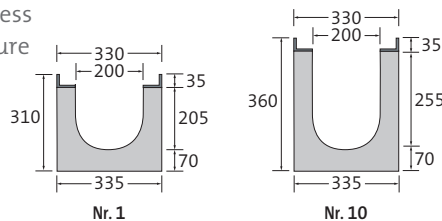


# BIRCOprotect | NW 200

Safe groundwater protection even with heavy loads

## Channel elements | 0.5% internal inbuilt fall

- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint



Description	Length	Width at top/ at ground	Height at groove/tongue	Weight	Load class DIN EN 1433	Article No.
Channel No. 1	1000 mm	330/335 mm	310/315 mm	140.9 kg	A 15 – F 900	042201
Channel No. 2	1000 mm	330/335 mm	315/320 mm	141.9 kg	A 15 – F 900	042202
Channel No. 3	1000 mm	330/335 mm	320/325 mm	142.9 kg	A 15 – F 900	042203
Channel No. 4	1000 mm	330/335 mm	325/330 mm	144.9 kg	A 15 – F 900	042204
Channel No. 5	1000 mm	330/335 mm	330/335 mm	145.9 kg	A 15 – F 900	042205
Channel No. 6	1000 mm	330/335 mm	335/340 mm	148.9 kg	A 15 – F 900	042206
Channel No. 7	1000 mm	330/335 mm	340/345 mm	149.9 kg	A 15 – F 900	042207
Channel No. 8	1000 mm	330/335 mm	345/350 mm	150.9 kg	A 15 – F 900	042208
Channel No. 9	1000 mm	330/335 mm	350/355 mm	153.9 kg	A 15 – F 900	042209
Channel No. 10	1000 mm	330/335 mm	355/360 mm	154.9 kg	A 15 – F 900	042210

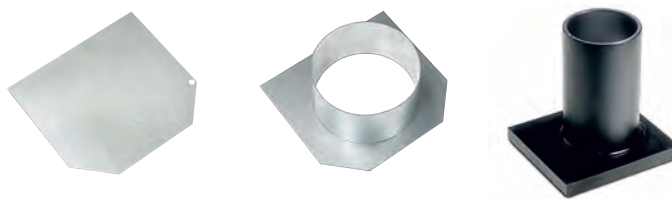
## Channel elements | without internal inbuilt fall

- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint

Description	Length	Width at top/ at ground	Height at groove/tongue	Weight	Load class DIN EN 1433	Article No.
Channel No. 0/0	500 mm	330/335 mm	310/310 mm	70.5 kg	A 15 – F 900	042231
Channel No. 0/0	1000 mm	330/335 mm	310/310 mm	139.9 kg	A 15 – F 900	042226
Channel No. 5/0	1000 mm	330/335 mm	335/335 mm	145.9 kg	A 15 – F 900	042227
Channel No. 10/0	1000 mm	330/335 mm	360/360 mm	154.9 kg	A 15 – F 900	042228

Exception up to D 400: Not for use across the carriage-way of highways or motorways.

## End caps

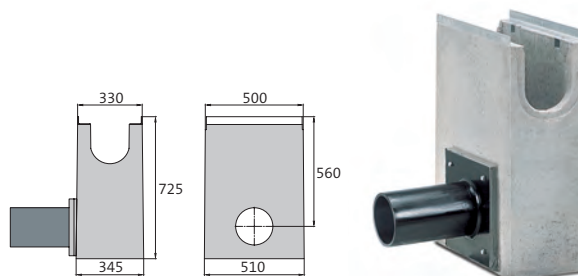


Description	Width	For construction height	Weight	Article No.
End cap galvanised, No. 0/0 – 6	330 mm	310 – 340 mm	1.5 kg	042240
End cap galvanised, No. 7 – 10	330 mm	340 – 360 mm	1.7 kg	042241
End cap with outlet DN 200, galvanised, No. 0/0	330 mm	310 mm	2.1 kg	042245
End cap with outlet DN 200, galvanised, No. 5/0	330 mm	335 mm	2.3 kg	042246
End cap with outlet DN 200, galvanised, No. 10/0	330 mm	360 mm	2.5 kg	042247
End cap with outlet DA 200 x 4.9 - SDR 41, PEHD, No. 0/0, length 300 mm	330 mm	310 mm	4.8 kg	044206
End cap with outlet DA 200 x 4.9 - SDR 41, PEHD, No. 5/0, length 300 mm	330 mm	335 mm	5.0 kg	044207
End cap with outlet DA 200 x 4.9 - SDR 41, PEHD, No. 10/0, length 300 mm	330 mm	360 mm	5.2 kg	044208

Galvanised end caps also available in stainless steel.

## In-line outfall unit | with PEHD pipe support | 1-piece

- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + PEHD pipe support DA 200 x 4.9 - SDR 41, length 300 mm
- + Lateral drainage connection
- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint
- + Other outlets on request



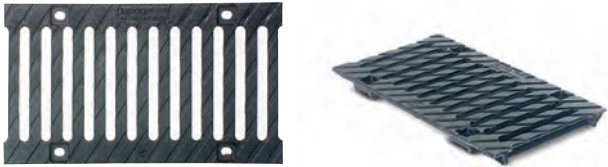
Description	Length	Width at top/ at ground	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit No. 0/0	500 mm	330/345 mm	725 mm	145.0 kg	A 15 – F 900	044203
In-line outfall unit No. 5/0	500 mm	330/345 mm	725 mm	145.0 kg	A 15 – F 900	044204
In-line outfall unit No. 10/0	500 mm	330/345 mm	725 mm	145.0 kg	A 15 – F 900	044205

Exception up to D 400: Not for use across the carriage- way of highways or motorways.



Cast slotted gratings

- + Black immersion-lacquered
- + Also available galvanised
- + 8 point per metre M12/A2 bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	317 mm	35 mm	17.3	SW 200/18 mm	802 cm²/m	A 15 – F 900	140278

Article No. with v = galvanised, article No. with e = with Easylock, SW = slot width, MW = mesh width  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.





Combination of different BIRCO channel systems and nominal widths.

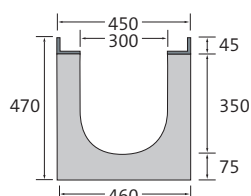


# BIRCOprotect | NW 300

Safe groundwater protection even with heavy loads

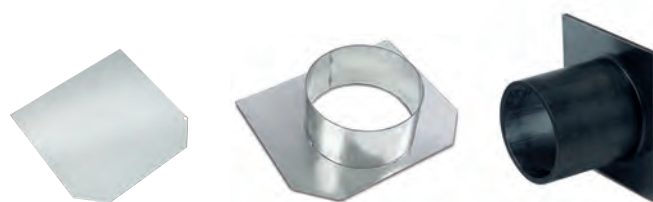
## Channel elements | without internal inbuilt fall

- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint



Description	Length	Width at top/ at ground	Height at groove/tongue	Weight	Load class DIN EN 1433	Article No.
No. 0/0	1000 mm	450/460 mm	470/470 mm	245.2 kg	A 15 – F 900	042326
No. 0/0	2000 mm	450/460 mm	470/470 mm	472.0 kg	A 15 – F 900	042334

## End caps



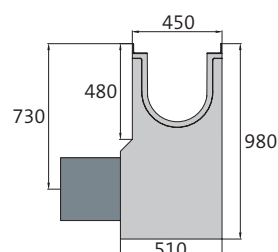
Description	Width	For construction height	Weight	Article No.
End cap, galvanised	450 mm	470 mm	4.4 kg	042340
End cap with outlet DN 200, galvanised	450 mm	470 mm	4.7 kg	042345
End cap with outlet DA 315 x 17.9 - SDR 17, PEHD, length 300 mm	450 mm	470 mm	10.1 kg	044301

Galvanised end caps also available in stainless steel.

Exception up to D 400: Not for use across the carriage-way of highways or motorways.

**In-line outfall unit | with pipe support | 1-piece**

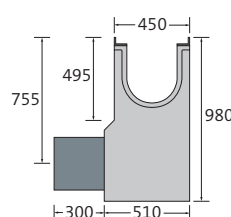
- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + Lateral drainage connection
- + Integrated pipe support for DN 300 connection
- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/ V4A, combi-closure system not in stainless steel)
- + Visible sealing joint
- + Sockets for smaller pipe dimensions also possible



Description	Length	Width at top/ at ground	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit	500 mm	450/510 mm	980 mm	255.0 kg	A 15 – F 900	044310

**In-line outfall unit | with PEHD pipe support | 1-piece**

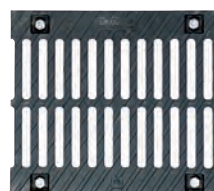
- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + PEHD pipe support DA 315 x 17.9 - SDR 17, length 300 mm
- + Lateral drainage connection
- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/ V4A, combi-closure system not in stainless steel)
- + Visible sealing joint
- + Other outlets on request



Description	Length	Width at top/ at ground	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit	500 mm	450/510 mm	980 mm	290.0 kg	A 15 – F 900	044300

**Cast slotted gratings | twofold**

- + Black immersion-lacquered
- + Also available galvanised
- + 8 point per metre M16/A2 bolt connection



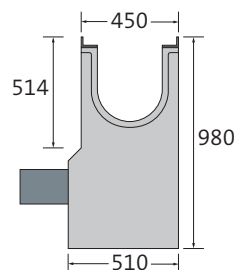
Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	437 mm	45 mm	35.3 kg	SW 142/20 mm	1491 cm <sup>2</sup> /m	A 15 – F 900	140378

Article No. with v = galvanised, article No. with e = with Easylock, SW = slot width  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.



**Shut-off outfall unit for NW 100 to 300 | 1-piece**

- + 1- or 2-sided channel connection until NW 300 (on request with end caps / adapter caps for channel connection mounted ex-works)
- + Manually operated valve flap DN 150
- + On request also with electrical or pneumatical valve flap
- + Galvanised silt bucket
- + PEHD pipe support DA 160x9.1 - SDR 17 (length 300 mm)
- + Pipe connector at right angles to channel line
- + With hot-dipped galvanised solid steel angles for combi-closure system
- + Visible sealing joint
- + Other outlets on request
- + Not DIBt certificated



Description	Length	Width at top/ at ground	Construction height	Weight	Load class DIN EN 1433	Article No.
Shut-off outfall unit	500 mm	450/510 mm	980 mm	345.0 kg	A 15 – E 600	044302

**Cast slotted gratings | twofold | for shut-off outfall unit**

- + With key bushing
- + Black immersion-lacquered
- + Including 4-point M16/A2 per grating bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	437 mm	45 mm	30.9 kg	SW 142/20 mm	1491 cm <sup>2</sup> /m	A 15 – F 900	044305

**Service key**

- + For shut-off outfall unit
- + For manual operation



Description	Weight	Article No.
Service key	3.4 kg	044303



BIRCOprotect NW 300 shut-off outfall unit.



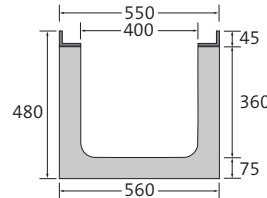


# BIRCOprotect | NW 400

Safe groundwater protection even with heavy loads

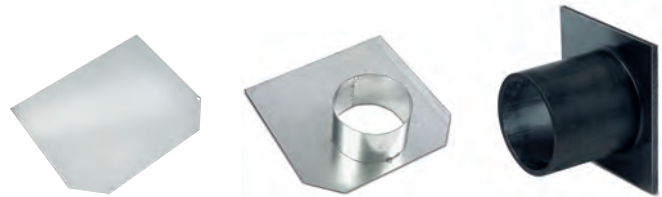
## Channel elements | without internal inbuilt fall

- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint



Description	Length	Width at top/ at ground	Height at groove/tongue	Weight	Load class DIN EN 1433	Article No.
No. 0/0	1000 mm	550/560 mm	480/480 mm	245.2 kg	A 15 – F 900	042426
No. 0/0	2000 mm	550/560 mm	480/480 mm	483.0 kg	A 15 – F 900	042434

## End caps

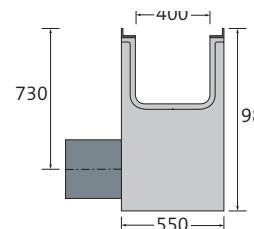


Description	Width	For construction height	Weight	Article No.
End cap, galvanised	550 mm	480 mm	5.5 kg	042440
End cap with outlet DN 300, galvanised	550 mm	480 mm	7.1 kg	042445
End cap with outlet DA 315 x 17.9 - SDR 17, PEHD, length 300 mm	550 mm	480 mm	9.8 kg	044401

Galvanised end caps also available in stainless steel.

## In-line outfall unit | with pipe support | one-piece

- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + Integrated pipe support for DN 300 connection
- + Lateral drainage connection
- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint
- + Sockets for smaller pipe dimensions also available

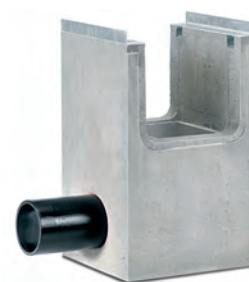
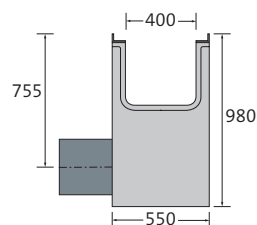


Description	Length	Width at top/ at ground	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit	500 mm	550/550 mm	980 mm	255.0 kg	A 15 – F 900	044410

Exception up to D 400: Not for use across the carriage-way of highways or motorways.

**In-line outfall unit | with PEHD pipe support | 1-piece**

- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + PEHD pipe support DA 315 x 17.9 - SDR 17, length 300 mm
- + Lateral drainage connection
- + With hot-dipped galvanised solid steel angles for combi-closure system
- + As special solution also with stainless steel angles (V2A/V4A, combi-closure system not in stainless steel)
- + Visible sealing joint
- + Other outlets on request



Description	Length	Width at top/ at ground	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit	500 mm	550/550 mm	980 mm	245.0 kg	A 15 – F 900	044400

**Cast slotted gratings | twofold**

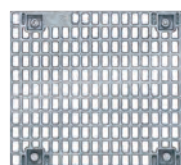
- + Black immersion-lacquered or galvanised
- + 8 point per metre M16/A2 bolt connection
- + 8 point per metre Easylock-fastening (alternatively)



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	537 mm	45 mm	45.2 kg	SW 190/16 mm	1771 cm <sup>2</sup> /m	A 15 – E 600	140475/e
galvanised	500 mm	537 mm	45 mm	42.3 kg	SW 190/16 mm	1771 cm <sup>2</sup> /m	A 15 – E 600	140475v/ve
black	500 mm	537 mm	45 mm	52.1 kg	SW 190/16 mm	1771 cm <sup>2</sup> /m	A 15 – F 900	140478

**Mesh gratings | cast**

- + Black immersion-lacquered or galvanised
- + 8 point per metre M16/A2 bolt connection
- + 8 point per metre Easylock-fastening (alternatively)

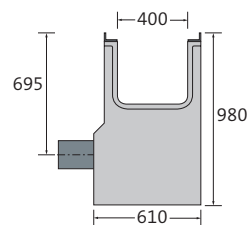


Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	537 mm	45 mm	44.5 kg	MW 20/30 mm	2310 cm <sup>2</sup> /m	A 15 – E 600	140486/e
galvanised	500 mm	537 mm	45 mm	47.4 kg	MW 20/30 mm	2310 cm <sup>2</sup> /m	A 15 – E 600	140486v/ve

Article No. with v = galvanised, article No. with e = with Easylock, SW = slot width, MW = mesh width  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

**Shut-off outfall unit | 1-piece**

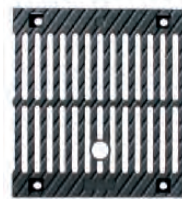
- + 1- or 2-sided channel connection up to NW 400 (on request with end caps / adapter caps for channel connection mounted ex-works)
- + Manually operated valve flap DN 200
- + On request also with electrical or pneumatical valve flap
- + Galvanised silt bucket
- + PEHD pipe support DA 225x12.8 - SDR 17 (length 300 mm)
- + Pipe support lateral to channel line
- + With hot-dipped galvanised solid steel angles for combi-closure system
- + Visible sealing joint
- + Other outlets on request
- + Not DIBt certificated



Description	Length	Width at top/ at ground	Construction height	Weight	Load class DIN EN 1433	Article No.
Shut-off outfall unit	500 mm	550/610 mm	980 mm	366.0 kg	A 15 – E 600	044405

**Cast slotted gratings | twofold | for shut-off outfall unit**

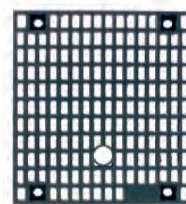
- + With key bushing
- + Black immersion-lacquered
- + Including 4-point M16/A2 per grating bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	537 mm	45 mm	40.0 kg	SW 190/16 mm	1771 cm <sup>2</sup> /m	A 15 – E 600	044404

**Mesh gratings | cast | for shut-off outfall unit**

- + With key bushing
- + Black immersion-lacquered or galvanised
- + Including 4-point M16/A2 per grating bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	537 mm	45 mm	47.4 kg	MW 20/30 mm	2310 cm <sup>2</sup> /m	A 15 – E 600	044411
galvanised	500 mm	537 mm	45 mm	47.4 kg	MW 20/30 mm	2310 cm <sup>2</sup> /m	A 15 – E 600	044411v

Article No. with v = galvanised, SW = slot width, MW = mesh width  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

**Service key**

- + For shut-off outfall unit
- + For manuel operation



Description	Weight	Article No.
Service key	3.4 kg	044303

**i** BIRCOprotect | PEHD

- + PEHD (Polyethylen High Density) is continuously resistant against many aggressive media. Pipe supports and end caps in PEHD are available for BIRCOprotect.

# BIRCOprotect | Installation Instructions

A number of details must be observed when installing BIRCOprotect. For a comprehensive description please read [here](#).

To guarantee smooth operation and compliance with the requirements in accordance with DIN EN 1433, the following general valid installation instructions must be observed:

1. Prior to installation, the correct load class in accordance with DIN EN 1433 must be selected.
2. Thanks to the high level of stability, laying the BIRCOprotect channels is conducted on an earth-moist C 25/30 strip of foundation concrete at least 15 cm high which must be tapered in a conical shape on both sides. No additional encasing or reinforcement on the sides is required<sup>(1)</sup>. Begin laying the channel line following the outfall with the highest channel at the drain and form the channel line with the next-smallest number.
3. **All adjoining pavement surfaces must run permanently at a level of some 3 to 5 mm higher than the upper edge of the channel. In order to achieve this, we recommend laying the first two to three rows of pavement surfacing in the mortar bed.** Because there is no concrete encasing, the surface pavement can run right up to the channel without any problems. Connections to plates or pavements require a joint of 10 mm.
4. For installation in concrete surfaces or reinforced concrete constructions, running joints must be provided on both sides to compensate horizontal forces that emerge. These joints should be planned at an interval of some 0.2 to 0.5 metres from the channel. In sealing the adjacent areas it must be ensured that there is no mechanical damage to the channel units. Joints running diagonally to the channel line must be arranged every 5 – 6 metres in the adjacent concrete surfaces (in-situ concrete) so that they run through a channel end.
5. BIRCOprotect drainage units are to be fitted with a sealing joint at the channel joint. The sealing joint must be grouted with jointing material (such as BIRCOplast) in accordance with the official water legislation-related approval certification.
6. Proceed analogously when installing the outfall units.

7. Local particularities can require special installation methods that have to be examined and taken into account by the planner(s). The installation must comply with the latest regulations and guidelines such as ZTVT, ZTV concrete, ZTV bit and RStO.

- + Construction in accordance with the Construction Tendering and Contract Regulations (VOB) Part C, DIN 18318 "Transport Route Construction".
- + Additional technical regulations and guidelines for pavement surfaces in road construction (ZTVT-StB) and ZTV Asphalt.
- + Additional technical regulations and guidelines for ground work in road construction (ZTVE-StB).
- + Guidelines for the standardisation of the pavement of public thoroughfares (RStO).
- + Preparation of the ATV DIN 18299 performance description "General Regulations for Construction Work of all Types".
- + The respectively correct load class in accordance with DIN EN 1433, "Drainage channels for vehicular and pedestrian areas".

## Additional requirements:

- + **The laying and sealing work must be conducted by an authorised company specialising in such work (in accordance with regulation on facilities for handling water-hazardous substances §3). In addition to these installation instructions, also observe the technical details (jointing) and the usage instructions on the BIRCO-Primer and BIRCOplast containers.**

<sup>(1)</sup> Exception:

When using BIRCOprotect in heavy-duty areas with frequent traffic, it may be necessary to encase the channel with concrete on the sides to compensate for the high levels of horizontal forces that could potentially emerge.

# Installation instructions in accordance with DIBt certification

**Installation instructions for traffic areas where substances accrue that are hazardous to water.**  
**Fuel depots | Water collection points | Chemical companies | Storage, filling and transferring facilities for water-hazardous substances**

## General information

1. The installation of BIRCOprotect may in Germany only be conducted by companies that specialise in such activities in accordance with regulation on facilities for handling water-hazardous substances §3. These companies, including their personnel, must have been trained to do such work by an authorised institution. Specific nation requirements must be verified locally.
2. The installation of BIRCOprotect requires compliance with BIRCO's installation and processing instructions. The requirements specified in the general DIBt certification regarding installation, maintenance and verification must be observed to the letter.
3. The installation of the channel systems must be conducted from on the basis of engineering considerations. Construction documentation must be prepared. The design of any facilities for storing, filling and transferring liquids hazardous to water must take the respectively applicable water legislation provisions governing drainage and the control of precipitation water into account. The requirements from other legal sectors (e.g., work safety, hazardous materials legislation, the German Ordinance on Industrial Safety and Health) remain unaffected and in full effect.
4. Liquids hazardous to water that have escaped must be recognised as quickly as possible, in any case no later than within 72 hours, and removed from the channel systems. Transferring and filling procedures must always be visually monitored for leakages. Should leakages be discovered, measures to eliminate them must be undertaken.
5. The channel systems must be cleaned of dirt and collected mixtures of dirt and liquids hazardous to water. Cleaning of the channel systems also includes cleaning of the inline outfall units or silt buckets.
3. The joints between pre-fabricated parts of the channel systems and between pre-fabricated parts and the surfaces to be sealed must be grouted using a joint sealing system that has general official certification or which is technically certified in Europe for the intended purpose.
4. Prior to laying the pre-fabricated parts, it must be established that the documentation corresponds with the requirements.
5. The pre-fabricated parts must be laid flush onto the concrete base layer.
6. Damaged concrete pre-fabricated parts may not be used.
7. When applying joint sealant, it must be ensured that there is a sealant connection between diagonal joints and longitudinal joints.
8. When laying pre-fabricated parts, drawings verifying the correct assembly are to be prepared by the construction supervisor or his/her representative.

## Regulations for use, upkeep and maintenance

1. We refer expressly here to the necessity for operators of facilities for the storage, filling and transfer of substances that can be hazardous to water to conduct constant monitoring of the seal tightness, respectively, the functionality of the pre-fabricated parts in accordance with regulation on facilities for handling water-hazardous substances §1.
2. After each contact with hazardous agents, the channel systems must first be visually inspected in regard to their functionality. If necessary, additional measures must be undertaken.
3. The operator of the facility is obligated to appoint only such companies to conduct maintenance, repair and cleaning of the pre-fabricated parts as are specialist businesses as defined Regulation on facilities for handling water-hazardous substances §1 and which are referred for such work by the manufacturer, unless the required work is exempted from this obligation in accordance with applicable state legislative provisions.
4. The general maintenance instructions contained in the BIRCOprotect installation instructions continue to apply.

## Installation

1. The installation instructions contained in the general DIBt certification, respectively, in the installation instructions prepared by BIRCO, must be complied with. System components may not be replaced with components that are not part of the system.
2. Installation must be conducted in accordance with the construction drawings, respectively, with the installation instructions. Particularities of the location can require special types of installation which must be examined and taken into account by the planner(s).





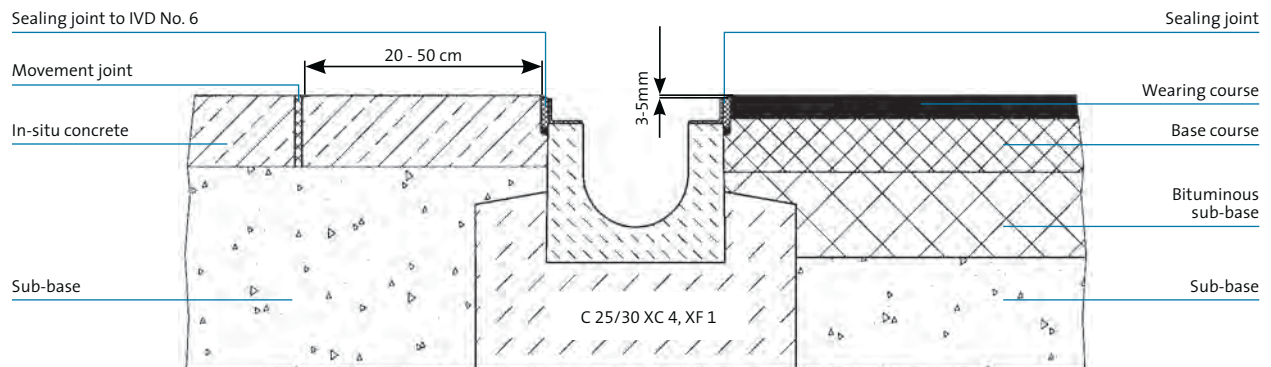
# BIRCOprotect – Installation Instructions

Installation instructions for traffic areas with high wheel loads.

Ports | Dock facilities | Freight company premises

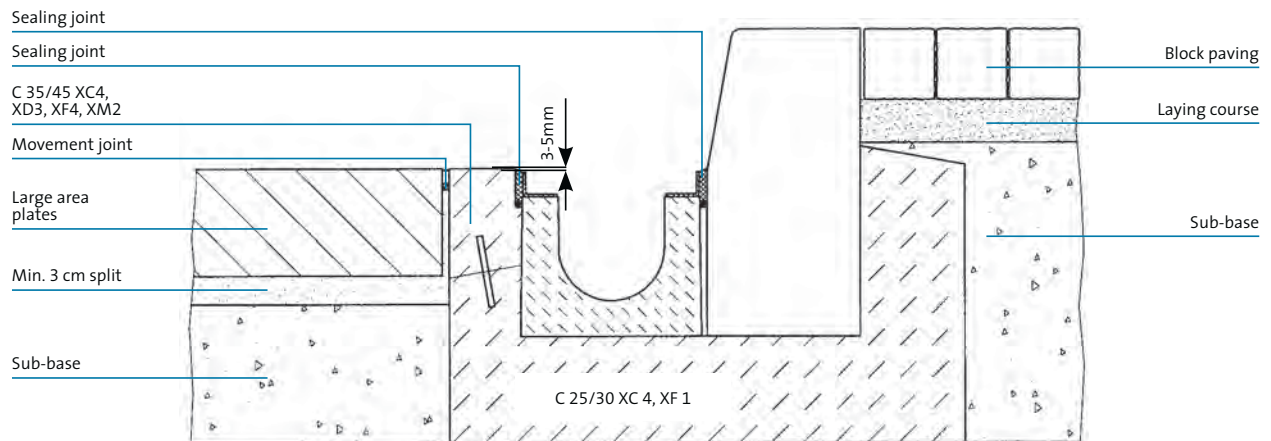
**Class A 15 to E 600, Type M, NW 100 - 400**

Drawing No. 8625, 8626, 8627, 8628, 8629



**Class A 15 to E 600, Type M, NW 100 - 400**

Drawing No. 8625, 8626, 8627, 8628, 8629

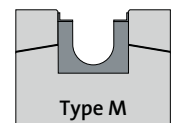


## Distinction between 2 types

- + **Type I:** Requires no load-bearing foundation and/or no encasing: for example BIRCOsolid grid channel.
- + **Type M:** Requires a load-bearing foundation and/or encasing: for example BIRCOsir.



Type I



Type M

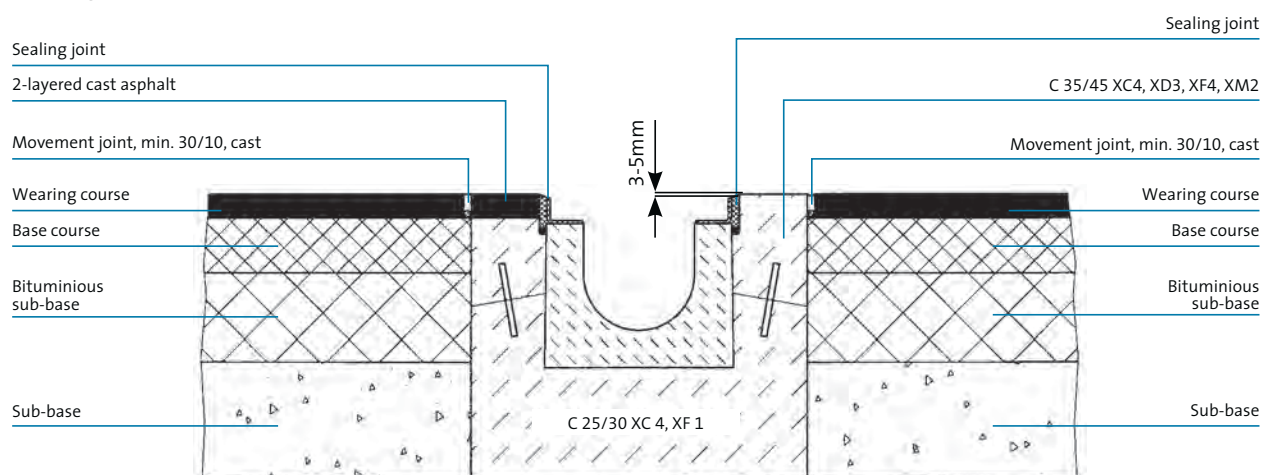
Constructed in accordance with RSTO using non-settling frost-free sub-bases.  
Exception up to D 400: Not for use across the carriage-way of highways or motorways.

# BIRCOprotect - Installation Instructions

Expanded installation instructions for heavy-duty load areas exposed to frequent use.  
Logistics centres | Transport hubs | Vehicle manoeuvring | Aircraft pavements

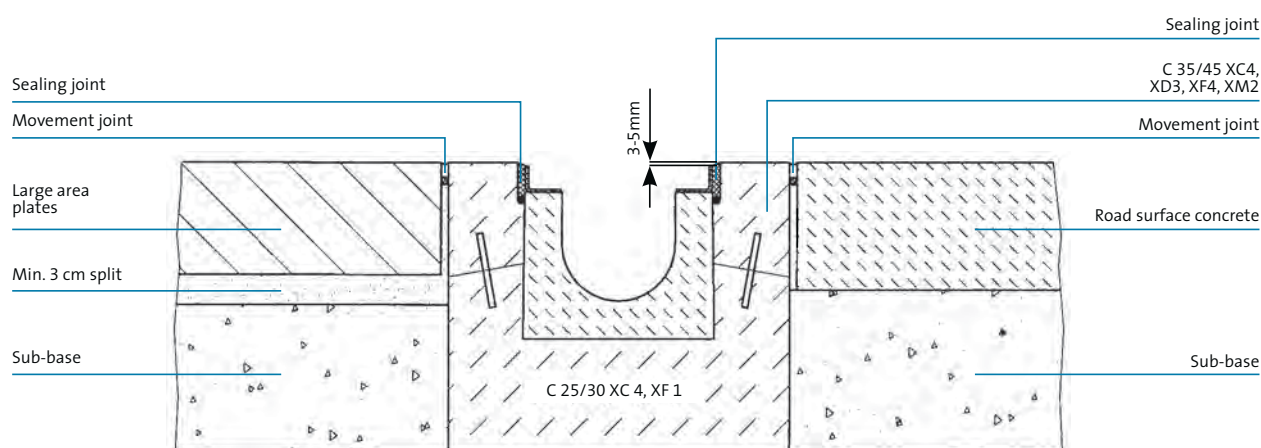
## Class D 400 to F 900, Type M, NW 100 - 400

Drawing No. 8625, 8626, 8627, 8628, 8629



## Class D 400 to F 900, Type M, NW 100 - 400

Drawing No. 8625, 8626, 8627, 8628, 8629



When pavement surfaces are being laid and pressed, it must be ensured that the pavement material is not forced against the blocks.

Constructed in accordance with RSTO using non-settling frost-free sub-bases  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

The dimensions of the concrete surround must be adapted to the circumstances on-site and must consist of at least 15 cm. If no bond can be created between the base and the concrete surround, then dowel bars or floatation controls made of  $\varnothing$  8 mm reinforced bars are to be installed every 30 cm. The concrete qualities indicated are minimum values. Requirements related to the installation location according to DIN 1045-2 or DIN EN 206-1 regarding for instance resistance to frost and de-icing salt are to be taken into account in the choice of the concrete.

#### Bolt connection note:

For heavy-duty load areas subjected to frequent traffic and in shunting areas, we recommend using threaded bolts instead of fast connection systems (such as Easy-lock). Torque moments for screwing on the gratings are to be set at M12 = 60 Nm, M16 = 100 Nm.

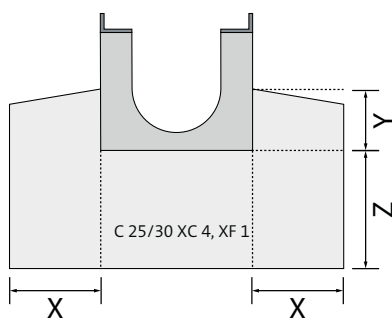
The bolts must be re-tightened at regular intervals.

## BIRCOprotect Overview

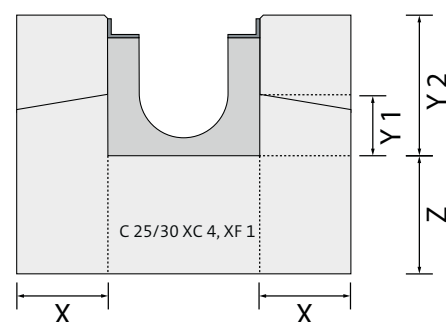
The manufacturer's installation instructions must be followed in order to comply with the requirements stipulated by DIN EN 1433. The requirements according to the official certification by DIBt apply in regard to installation, verification and maintenance.

### BIRCOprotect

Nominal width	Type	Load class	X	Y/Y 1	Y 2	Z	Drawing No.	Page
BIRCOprotect 100	M	A 15 – E 600	$\geq 100$	$\geq 100 - 150$	–	$\geq 150$	8625	40
BIRCOprotect 100	M	D 400 – F 900	$\geq 100$	$\geq 100 - 150$	Construction height + 5 mm	$\geq 150$	8625	41
BIRCOprotect 150	M	A 15 – E 600	$\geq 100$	$\geq 100 - 150$	–	$\geq 150$	8626	40
BIRCOprotect 150	M	D 400 – F 900	$\geq 100$	$\geq 100 - 150$	Construction height + 5 mm	$\geq 150$	8626	41
BIRCOprotect 200	M	A 15 – E 600	$\geq 100$	$\geq 100 - 150$	–	$\geq 150$	8627	40
BIRCOprotect 200	M	D 400 – F 900	$\geq 100$	$\geq 100 - 150$	Construction height + 5 mm	$\geq 150$	8627	41
BIRCOprotect 300	M	A 15 – E 600	$\geq 100$	$\geq 200$	–	$\geq 150$	8628	40
BIRCOprotect 300	M	D 400 – F 900	$\geq 100$	$\geq 200$	Construction height + 5 mm	$\geq 150$	8628	41
BIRCOprotect 400	M	A 15 – E 600	$\geq 100$	$\geq 200$	–	$\geq 150$	8629	40
BIRCOprotect 400	M	D 400 – F 900	$\geq 100$	$\geq 200$	Construction height + 5 mm	$\geq 150$	8629	41



Installation without concrete surround



Installation with concrete surround

## BIRCOprotect Drainage capacities

BIRCO channel systems provide outstanding drainage performance. BIRCO offers a calculation service in addition to this diagram.

### BIRCOprotect NW 100 | 1 % inbuilt fall

CL = 1000 mm	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	4.94 l/sec*	89.0 cm <sup>2</sup>
No. 1	8.25 l/sec*	99.0 cm <sup>2</sup>
No. 2	9.08 l/sec*	109.0 cm <sup>2</sup>
No. 3	9.92 l/sec*	119.0 cm <sup>2</sup>
No. 4	10.75 l/sec*	129.0 cm <sup>2</sup>
No. 5	11.58 l/sec*	139.0 cm <sup>2</sup>
No. 5/0	7.72 l/sec*	139.0 cm <sup>2</sup>
No. 6	12.42 l/sec*	149.0 cm <sup>2</sup>
No. 7	13.25 l/sec*	159.0 cm <sup>2</sup>
No. 8	14.08 l/sec*	169.0 cm <sup>2</sup>
No. 9	14.92 l/sec*	179.0 cm <sup>2</sup>
No. 10	15.75 l/sec*	189.0 cm <sup>2</sup>
No. 10/0	10.50 l/sec*	189.0 cm <sup>2</sup>

\*Safety factor  $\nu = 1.2$

### BIRCOprotect NW 150 | 0.5 % inbuilt fall

CL = 1000 mm	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	11.17 l/sec*	201.0 cm <sup>2</sup>
No. 1	12.29 l/sec*	208.5 cm <sup>2</sup>
No. 2	12.73 l/sec*	216.0 cm <sup>2</sup>
No. 3	13.17 l/sec*	223.5 cm <sup>2</sup>
No. 4	13.61 l/sec*	231.0 cm <sup>2</sup>
No. 5	14.05 l/sec*	238.5 cm <sup>2</sup>
No. 5/0	13.25 l/sec*	238.5 cm <sup>2</sup>
No. 6	14.50 l/sec*	246.0 cm <sup>2</sup>
No. 7	14.94 l/sec*	253.5 cm <sup>2</sup>
No. 8	15.38 l/sec*	261.0 cm <sup>2</sup>
No. 9	15.82 l/sec*	268.5 cm <sup>2</sup>
No. 10	16.26 l/sec*	276.0 cm <sup>2</sup>
No. 10/0	15.33 l/sec*	276.0 cm <sup>2</sup>

\*Safety factor  $\nu = 1.2$

### BIRCOprotect NW 200 | 0.5 % inbuilt fall

CL = 1000 mm	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	20.39 l/sec*	367.0 cm <sup>2</sup>
No. 1	22.17 l/sec*	377.0 cm <sup>2</sup>
No. 2	22.76 l/sec*	387.0 cm <sup>2</sup>
No. 3	23.34 l/sec*	397.0 cm <sup>2</sup>
No. 4	23.93 l/sec*	407.0 cm <sup>2</sup>
No. 5	24.52 l/sec*	417.0 cm <sup>2</sup>
No. 5/0	23.17 l/sec*	417.0 cm <sup>2</sup>
No. 6	25.11 l/sec*	427.0 cm <sup>2</sup>
No. 7	25.70 l/sec*	437.0 cm <sup>2</sup>
No. 8	26.28 l/sec*	447.0 cm <sup>2</sup>
No. 9	26.87 l/sec*	457.0 cm <sup>2</sup>
No. 10	27.46 l/sec*	467.0 cm <sup>2</sup>
No. 10/0	25.94 l/sec*	467.0 cm <sup>2</sup>

\*Safety factor  $\nu = 1.2$

### BIRCOprotect NW 300

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	52.9 l/sec*	953.0 cm <sup>2</sup>

\*Safety factor  $\gamma = 1.2$

### BIRCOprotect NW 400

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	74.91 l/sec*	1348.0 cm <sup>2</sup>

\*Safety factor  $\nu = 1.2$

The tables can only give guidelines for the dimensioning. On-site conditions such as positions of manholes already installed, number of channel lines etc. cannot and have not been taken into account. We therefore recommend making use of our hydraulic calculation service which provides you with a draft proposal.



## Hole drilling horizontal and vertical

We can fit BIRCOprotect channels with horizontal or vertical bore holes for directly fitting feed and drainage lines according to your plans. The connections available differ according to the nominal widths, ranging from DN 100 to DN 300. The diameters are matched with channel base pipes;

different pipes are available upon request. Upon request the design of the pipe connection can also be supplied with double walls. Standard components from specialist retailers are also available for the junction between the sealed PE pipe and stoneware or PVC pipe.

### BIRCOprotect

NW	Hole drilling, horizontal maximal	Hole drilling, vertical maximal
100 mm	DN 150	DN 100
150 mm	DN 200	DN 150
200 mm	DN 250	DN 200
300 mm	DN 300	DN 300
400 mm	DN 300	DN 300

Bore holes must be a distance of at least 100 mm away from the end of the channel.

## Everything for jointing – Information

### Jointing the channel joints | Two-flank adhesion

#### Sealants, tools

We supply everything you need to guarantee seal tightness and system safety for BIRCOprotect. This also includes a complete program with filler cord, special primers, jointing

materials and a preparation set. BIRCO customers profit from complete solutions that are genuinely complete.

#### Sealants

- + **BIRCO-Primer K1** for non-absorbent surfaces such as glass, enamel, stainless steel, galvanised steel, ceramic tiles, etc.
- + **BIRCO-Primer K2** for absorbent surfaces such as concrete, autoclaved aerated concrete, stone, plaster, etc.
- + **BIRCOplast**, is a dual-component, permanently elastic polysulfide-based sealant mass that is resistant to mineral oil and fuels
- + **PE-cord**

#### Tools

- + Tool cleaner
- + Hand mixer
- + Grouting gun
- + Spiral stirrer
- + **Work Set** includes a grouting gun with 3 nozzles, hand mixer (stand pipe and foot), spiral stirrer



## Material requirements diagram

### For the channel joint

NW	No.	Cord length	BIRCOplast	BIRCO-Primer K2
100	0/0 – 5	515 mm	71.0 ml	10 ml
100	6 – 10	615 mm	86.0 ml	10 ml
150	0/0 – 5	595 mm	82.5 ml	15 ml
150	6 – 10	645 mm	90.0 ml	15 ml
200	0/0 – 5	765 mm	108.5 ml	20 ml
200	6 – 10	815 mm	116.0 ml	20 ml
300	0/0	1160 mm	144.0 ml	25 ml
400	0/0	1300 mm	160.0 ml	26 ml

### For the one-sided channel longitudinal joint\* per metre

NW	No.	Cord length	BIRCOplast	BIRCO-Primer K1/K2
100	0/0 – 5	1000 mm	400.0 ml	20/20 ml
100	6 – 10	1000 mm	400.0 ml	20/20 ml
150	0/0 – 5	1000 mm	400.0 ml	20/20 ml
150	6 – 10	1000 mm	400.0 ml	20/20 ml
200	0/0 – 5	1000 mm	459.0 ml	20/20 ml
200	6 – 10	1000 mm	459.0 ml	20/20 ml
300	0/0	1000 mm	550.0 ml	20/30 ml
400	0/0	1000 mm	550.0 ml	20/30 ml

\* With NW 100, 150: groove width 10 mm, groove depth 55 mm, sealant depth 40 mm, with NW 200: groove width 10 mm, groove depth 60 mm, sealant depth 45 mm and with NW 300, 400: groove width 10 mm, groove depth 70 mm, sealant depth 55 mm

## Jointing with BIRCOplast

### Jointing the channel joints | Two-flank adhesion

#### A secure seal

BIRCOprotect is manufactured from Class C 40/50 / C 30/37 concrete. The system units are produced already fitted with a channel joint that has to be filled with sealant in accordance with the official DIBt certification. This ensures that no liquids contaminate the ground and groundwater. The sealing joint's special shape and the execution of the jointing work as described below allow for a better completed seal that complies with the jointing requirements of Data Sheet No. 6 from the IVD ('German Industrial Sealant Association'): two-flank adhesion. The connecting joint between two channels is preferably back-filled with a PE cord. The back-filling material has to provide sufficient resistance once it has been installed and

the sealant is applied. This is why its diameter should be approximately 1/3 larger than that of the joint width.

The PE filling cord is required for the following reasons:

- + Avoiding three-flank adhesion
- + Restricting the joint depth

This process and jointing method are known from other operations including petrol station construction. (Sealing ground joints with elastic sealants in areas subject to vehicle traffic at petrol station filling facilities – On this refer also to IVD Data Sheet No. 6.)

### Jointing with BIRCOplast



1. Channel groove at the tongue – prior to jointing



2. Preliminary priming



3. Inserting the PE sealing cord



4. Mixing the joint sealant



5. Applying the joint sealant



6. Smoothing the surface of the sealed joint

## Conducting Jointing Work

The first step is to inspect the moisture content of the concrete components. It must be ensured that the adhesive surfaces are sufficiently dry for the sealant to form a proper bond, so no jointing work may be conducted during rain or the day after a rainy day. The temperature of the adhesive surface may not be below + 5° C and may not exceed + 40° C.

### Procedure:

- Tape off the joint edges
- Pre-treat the adhesive surfaces with BIRCO-Primer K1 or Kw
- Insert the round PE cord to avoid three-flank adhesion

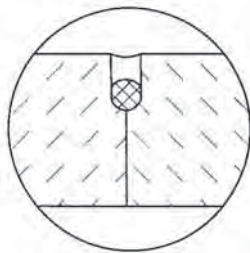
BIRCO-Primer K1 for non-absorbent surfaces (frame connectors, metal, etc.), BIRCO-Primer K2 for absorbent surfaces (channel, concrete, etc.). BIRCOplast may only be used in combination with the appropriate primer. The primer must be applied onto the joint flanks in an even, equally distributed layer with no empty spaces. When using a brush to apply the primer, ensure that concrete pores are sufficiently treated and filled completely; the primer film cannot be allowed to tear over slightly raised areas. The primer may also be applied with suitable spraying devices.

## Comparison of two-flank / three-flank adhesion

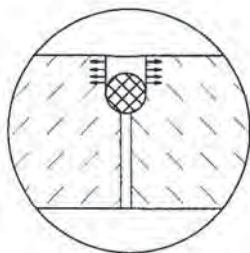
Work materials expand or contract due to temperature fluctuations, but the sealant only allows for maximum

expansion of 25%. If this value is exceeded, the material tears.

### Two-flank adhesion

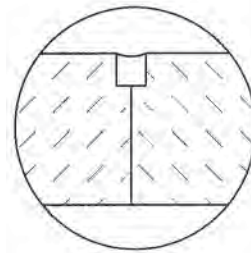


With two-flank adhesion, the jointing material is only connected with the concrete on two sides above the inserted round PE cord. This ensures the full elasticity of the sealant.

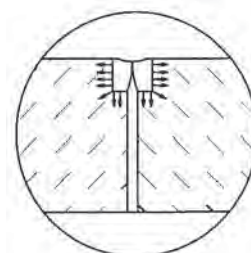


This means that local settling and temperature-related expansion can be compensated.

### Three-flank adhesion



With three-flank adhesion, the jointing material is connected with the concrete on three sides. Movement of the channels toward each other cannot be compensated in this way.



The jointing material can tear away from the lower flank.

## Sealing work qualifications

In accordance with the provisions of the WHG and the presiding authorities, jointing work must be conducted by a company specialising in such work in accordance with Regulation on facilities for handling water-hazardous substances, respectively, by a company authorised to conduct

such work by the sealant manufacturer. This applies for all situations where the work is subject to German law. (A list of authorised jointing companies is available from BIRCO.) Specific national requirements must be verified locally.

## Seal along the length of the channel

It is necessary to seal the junction between the channel and the pavement below the edge angle. When sealing the length of the channel, it must be ensured that the connection of the joint to be sealed is deep enough. This joint

must be so deep that once the filling cord has been inserted the sealant sufficiently covers and subsequently seals the junction from the channel to the edge angle.

## Jointing bore hole connections

In order to ensure a tight seal, the pipe connection and the channel joints have to be jointed with BIRCOplast:

- + Position the laminated PE pipe in the bore hole
- + Use the PE cord as a centring aid and insert it in a ring shape for sealing
- + Treat the channel with BIRCO-Primer K2
- + Treat the PE pipe with BIRCO-Primer K1
- + Allow the primed surfaces to air out
- + BIRCOplast and fill the joint

Jointing channels that have already been installed is an ideal situation, but the drainage pipe should be positioned prior to installation of the channels. A PVC pipe where the surface has been roughened can be sealed in the same way.

## Load capacity of the sealant

At 23° C, BIRCOplast's curing time is around 24 hours. After this period has elapsed, the joint seal is capable of bearing loads and can be subjected to rolling traffic. In this regard,

please also observe the instructions that come with the jointing material and in the Safety Data Sheet.

## Maintenance and repair

Sealing in the traffic area at petrol stations is intended to prevent automobile-related substances that are hazardous to water from making their way into surface water, any wastewater facilities or the ground. Inspection and maintenance on a regular basis is necessary for ensuring the long service life of the seal system. It is therefore necessary to conclude a maintenance contract. According to Regulation on facilities for handling water-hazardous substances §62 and 63, such facilities that are located within the jurisdiction of German civil law may only be installed, constructed, maintained and repaired by companies specialising in such

work. The qualification parameters for such a specialist company are precisely defined in the WHG.

To the extent that German civil law has no jurisdiction, the customer must clarify whether identical or similar regulations must be complied with and observed regarding the qualifications of the company conducting the laying work. In any case, inspection and maintenance conducted on a regular basis and secured by a maintenance contract are necessary.

## Filling-point concrete surfaces that must be sealed

A petrol station's filling-point is a separate area (operating area). The area contains the automobile-related substance filling facilities.

The separation of the filling point to the adjacent areas is created by:

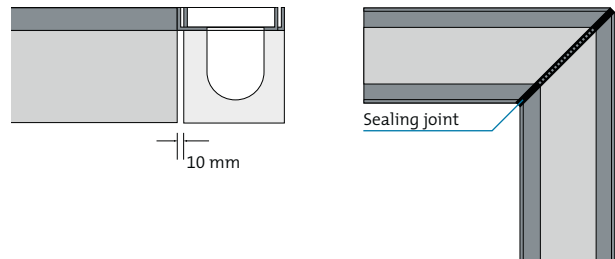
- + Channels (open or covered)
- + Upturn beams
- + Slope changes



## Additional installation information: BIRCOprotect jointing possibilities

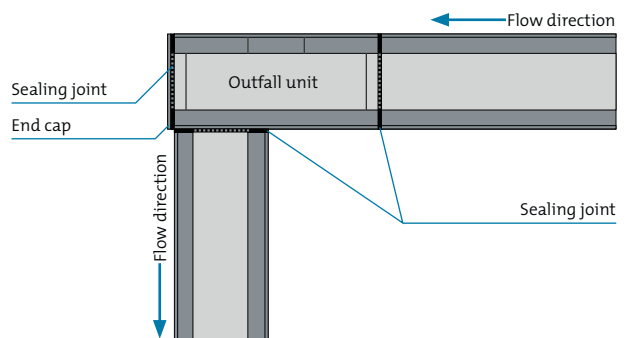
### Corner solution using a mitre cut

This mitre cut is jointed in the accustomed procedure, so the mitre must have a gap of 10 - 14 mm held in place on a mitre piece by a spacer. The PE cord is pushed into this gap in such manner that a filling depth of approximately 10 mm is retained for the plastic.



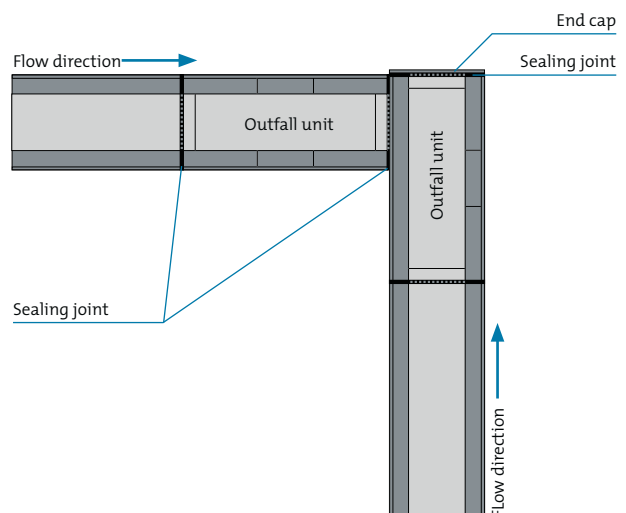
### Corner solution with in-line outfall units

The drainage of a channel line is conducted here via an in-line outfall units at the end of the channel. An additional line is pressed up against the side of the outfall unit. The gap that emerges is jointed in the accustomed procedure with sealant for BIRCOprotect. A connection to the in-line outfall unit from the side of the channel is inadvisable, since this would generate significant costs for special design production.



### Drainage with two in-line outfall units as a corner solution

The outfall units are pressed up against one another with a gap of 7 mm. Jointing is conducted in the accustomed procedure.

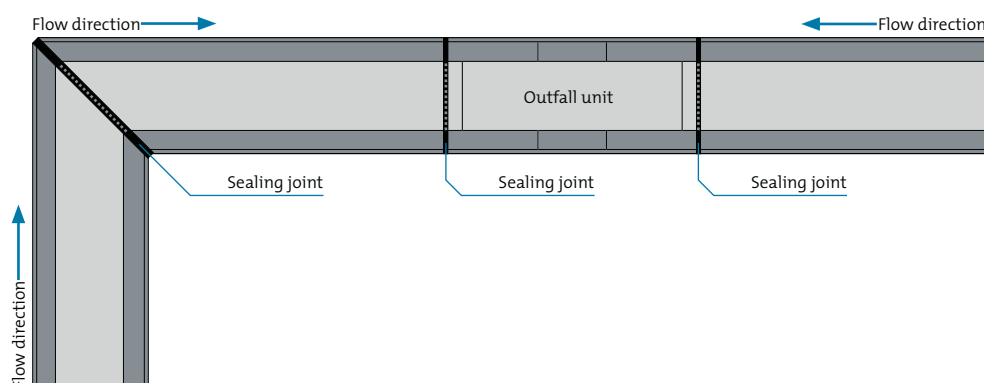


# Additional installation information: BIRCOprotect

## Drainage with two drainage lines in one outfall unit

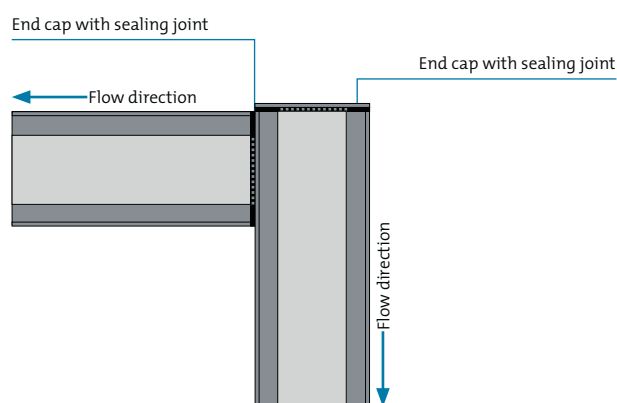
In-line outfall units are generally fitted with connection openings on two sides. BIRCOprotect in-line outfall units are available with connection heights of 0/0, 5/0 and 10/0.

For one-sided channel connection, the second connection opening can be closed with an end cap and sealed.



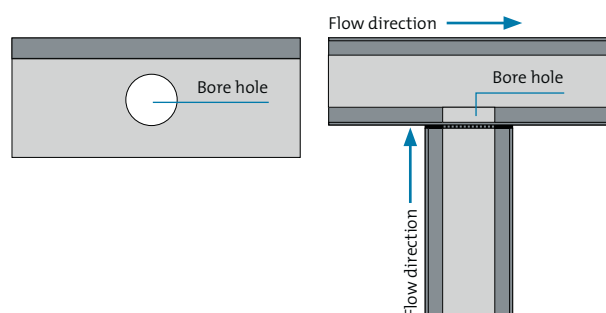
## Attaching end caps

For proper sealing, the front sides of channels and outfall units must be cleaned and capable of bearing loads and the end caps must be cleaned of all oils and greases and roughened at the points of adhesion. BIRCO-Primer K1 must be applied to the end caps and BIRCO-Primer K2 must be applied to the concrete contact surface. Once this has dried, a layer of BIRCOplast that is approximately 5 mm thick must be applied with a putty knife to the concrete contact surface. The end cap is placed onto this and evenly pressed into it so that BIRCOplast comes out of the sides of the connection points. There must be a minimum adhesion thickness of 2 mm. The front walls must be fixed for 24 hours. The material squeezing out from the sides is then smoothed out with a putty knife on the external and internal surfaces.



## Channel T-connections

For this, a bore hole is drilled into the side of a channel (diameter of the hole corresponds with the incoming channel profile). The incoming channel is placed at the drilled channel at a distance of 7 mm. With the 5 mm deep pre-shaped channel groove, a 10 mm wide gap emerges which is then jointed in the accustomed procedure.





# BIRCOsolid grid channels |

## Optimum seal – Top stability

The BIRCOsolid grid channel system ensures an optimum seal against liquids like fuels, oils and milder lye and acids. The monolithic reinforced concrete body stands up to extreme loads and is ideally suited for drainage project-related solutions.

+ A 15 to F 900



**F 900**

+ WHG Certificate  
No. Z-74.4-33



**WHG**



For drainage of areas subjected to high levels of dynamic horizontal forces. Resistant against mildly aggressive agents.

### BIRCOsolid grid channels | Areas of application

- + Heavy-duty load areas with heavy traffic
- + Container terminals, aircraft operation areas, loading areas
- + Areas in which mildly aggressive liquids can leak, such as petrol stations, lorry loading areas
- + Storage, filling and transferring facilities for water-hazardous substances / Areas subject to water legislation
- + Industrial construction

## BIRCOsolid grid channels | Facts

- + Channel system: NW 150, 200, 300 without inbuilt falls
- + Official certification (No. Z-74.4-33)
- + Made of constructively reinforced C 40/50 concrete
- + Also available with hot galvanised surface protection upon request
- + Construction lengths: 1.0, 1.5, 4.0 metres
- + Load class: A 15 – F 900
- + Outfall units in every nominal width with outstanding drainage performance
- + Shut-off outfall unit (not certified)





# BIRCOsolid grid channels |

## Optimum Seal – Top Stability

BIRCOsolid reinforced concrete box channels are the first choice in areas subjected to high levels of dynamic horizontal forces where groundwater protection is required



### Fast, safe installation

- + 4 metre long channel units make channel laying faster with fewer joints
- + One-piece channel units don't require a concrete casing. This reduces complicated, expensive concrete casing work.

### Traffic safety

- + High level of traffic safety thanks to the 8 bolt connections per metre.

### Corrosion protection

- + Stability and corrosion protection: 4 mm solid steel angles with a 70 µm zinc coating anchored in concrete.
- + Also available with one-piece hot-dipped galvanised surface protection.

### Safety concept

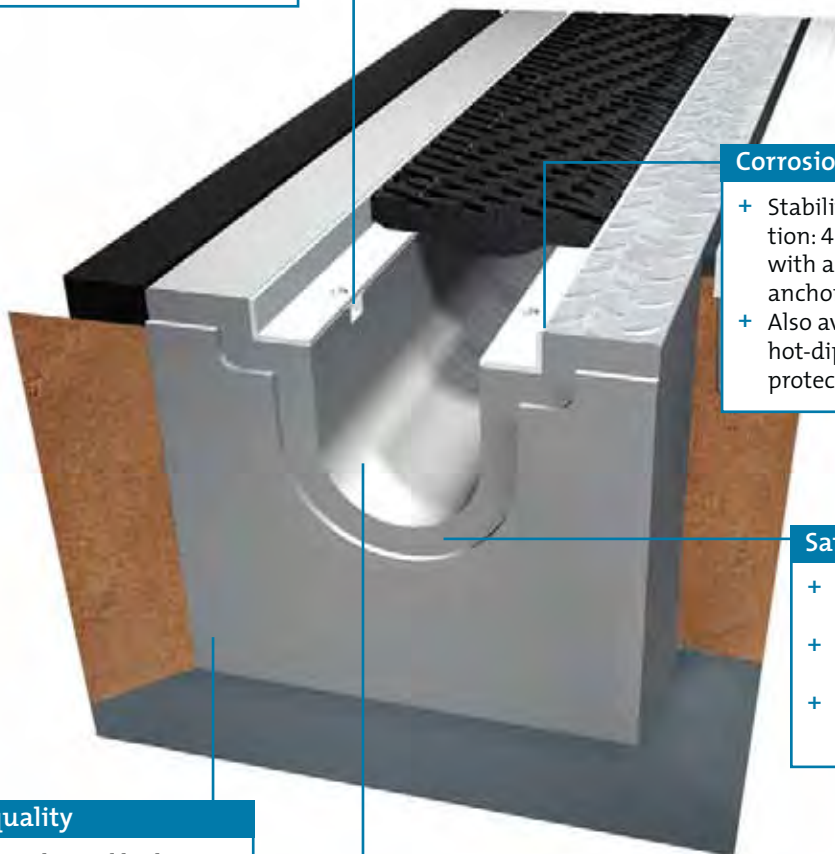
- + Sealing joint can be visually inspected.
- + 2-flank adhesion of the sealing joint guarantees top elasticity.
- + Officially certified (No. Z-74.4-33).

### Material quality

- + Monolithic channel body made of constructively reinforced C 40/50 concrete.
- + Resistant against mildly aggressive agents like petrol and mineral oils.

### Optimum hydraulics

- + Different construction heights.
- + For optimum application in large-scale areas subject to water legislation; featuring top hydraulic performance and large storage volumes.



## Cologne-Bonn Airport – Special mitre cuts

During expansion work at the Cologne-Bonn Airport, a new aircraft apron was created where aircraft can park, load, unload and refuel. BIRCOsolid grid channels were laid over a space of more than 900 metres in this heavy-duty load area that is subject to water legislation. Special installation variations and mitre cuts were supplied ex-factory.



## Paderborn Airport fuel depot – Water protection



Airport fuel depots are not only ecologically sensitive areas; they also have to permanently withstand the heaviest loads from constant heavy-duty lorry traffic. The former drainage channels broke down after only five years, so the airport's operators chose BIRCOsolid grid channels to replace them and to provide safe water protection even under the heaviest loads.

## Emden Northern Quay – Extreme horizontal loads

BIRCOsolid's 300 mm nominal width drainage system provides drainage at the Emden Northern Quay for the loading and shipping docks of the ENERCON GmbH company. A wind power station manufacturer from Aurich, Germany, ENERCON delivers its facilities throughout the world by ship. With wind power station rotor blades alone weighing some 10 tons, the BIRCOsolid drainage system was the perfect choice for this location, standing up to extreme horizontal loads and providing top drainage performance.

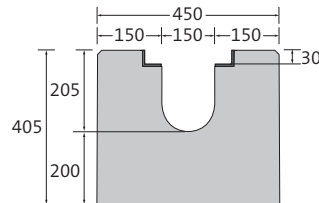


# BIRCOsolid grid channels | NW 150

The reinforced concrete channel for use with mildly aggressive agents

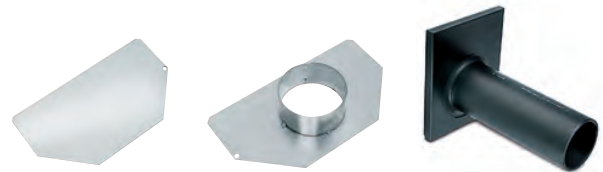
## Channel elements | without internal inbuilt fall

- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Anchor sleeves on the side
- + Fitted with an interior lifting anchor
- + Also available with one-piece hot-dipped galvanised surface protection upon request



Description	Length	Width	Construction height at groove/tongue	Weight	Load class DIN EN 1433	Article No.
Channel No. 0/0	1000 mm	450 mm	405/405 mm	380.0 kg	A 15 – F 900	015101
Channel No. 0/0	1500 mm	450 mm	405/405 mm	570.0 kg	A 15 – F 900	015102
Channel No. 0/0	4000 mm	450 mm	405/405 mm	1520.0 kg	A 15 – F 900	015103

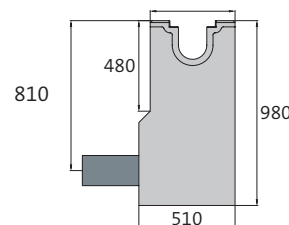
## End caps



Description	Width	For construction height	Weight	Article No.
End cap, galvanised	450 mm	405 mm	2.0 kg	015113
End cap with outlet DN 150, galvanised	450 mm	405 mm	2.2 kg	015111
End cap with outlet DA 160, PEHD, factory assembled	450 mm	405 mm	3.4 kg	015112

## In-line outfall unit | with pipe support | 1-piece

- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + Integrated pipe support for DN 150 connection
- + Without odour trap
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Also available with one-piece hot-dipped galvanised surface protection upon request



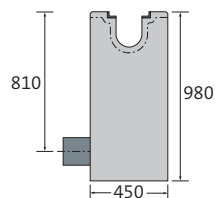
Description	Length	Width at angle/ground	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit	500 mm	450/510 mm	980 mm	364.4 kg	A 15 – F 900	015135

Exception up to D 400: Not for use across the carriage-way of highways or motorways



**In-line outfall units | with PEHD pipe support | 1-piece**

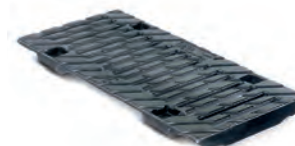
- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + PEHD pipe support DA 160x9.1 - SDR 17, length 300 mm
- + Lateral drainage connection
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Also available with one-piece hot-dipped galvanised surface protection upon request



Description	Length	Width	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit	500 mm	450/510 mm	980 mm	364.3 kg	A 15 – F 900	015136

**Cast slotted gratings**

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	237 mm	30 mm	10.7 kg	SW 150/12 mm	644 cm <sup>2</sup> /m	A 15 – E 600	150175
galvanised	500 mm	237 mm	30 mm	10.2 kg	SW 150/12 mm	644 cm <sup>2</sup> /m	A 15 – E 600	150175v
black	500 mm	237 mm	30 mm	12.4 kg	SW 150/12 mm	644 cm <sup>2</sup> /m	A 15 – F 900	150178

**Mesh gratings | cast**

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	237 mm	30 mm	11.2 kg	MW 20/30 mm	1110 cm <sup>2</sup> /m	A 15 – E 600	150186
galvanised	500 mm	237 mm	30 mm	11.2 kg	MW 20/30 mm	1110 cm <sup>2</sup> /m	A 15 – E 600	150186v

SW = slot width, MW = mesh width, article no. with v = galvanised  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

## BIRCOsolid grid channels NW 150

## Honeycomb gratings | cast

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	237 mm	30 mm	7.6 kg	MW 24/59 mm	1396 cm <sup>2</sup> /m	A 15 – E 600	150179
galvanised	500 mm	237 mm	30 mm	7.6 kg	MW 24/59 mm	1396 cm <sup>2</sup> /m	A 15 – E 600	150179v

## Hangers for RD 16 piping | can be mounted externally

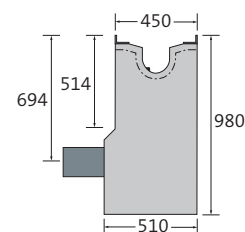
- + Commonly available RD 16 piping hangers are required for laying the concrete parts
- + For safety reasons, simple rope loops may not be used



Description	Weight	Article No.
Hanger RD 16	0.6 kg	606037

## Shut-off outfall unit NW 300 | for channels NW 150 | 1-piece

- + 1- or 2-sided channel connection up to NW 300 (on request with end caps / adapter caps for channel connection mounted ex-works)
- + Manually operated valve flap DN 150
- + On request also with electrical or pneumatical valve flap
- + Galvanised silt bucket
- + PEHD pipe support DA 160x9.1 - SDR 17 (length 300 mm)
- + Pipe connector at right angles to channel line
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Other outlets on request
- + Not certificated



Description	Length	Width at angle/ bottom	Construction height	Weight	Load class DIN EN 1433	Article No.
Shut-off outfall unit	500 mm	450/510 mm	980 mm	360.0 kg	A 15 – F 900	015396

MW = mesh width, article no. with v = galvanised,  
Exception up to D 400: Not for use across the carriage- way of highways or motorways

**Cast slotted gratings** | twofold | for shut-off outfall unit NW 300

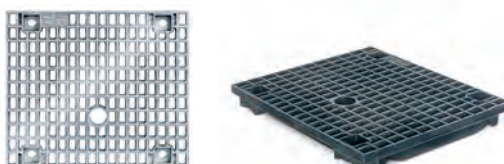
- + With key bushing
- + Black immersion-lacquered
- + Including 4-point M16/A2 per grating bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	437 mm	45 mm	23.0 kg	SW 142/20 mm	746 cm <sup>2</sup> /m	A 15 – C 250	150371
black	500 mm	437 mm	45 mm	30.9 kg	SW 142/20 mm	746 cm <sup>2</sup> /m	A 15 – E 600	150372

**Mesh gratings** | cast | for shut-off outfall unit NW 300

- + With key bushing
- + Black immersion-lacquered or galvanised
- + Including 4-point M16/A2 per grating bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	437 mm	45 mm	26.9 kg	MW 20/30 mm	1080 cm <sup>2</sup> /m	A 15 – E 600	150387
galvanised	500 mm	437 mm	45 mm	26.9 kg	MW 20/30 mm	1080 cm <sup>2</sup> /m	A 15 – E 600	150387v

**Service key**

- + For shut-off outfall unit
- + For manuel operation



Description	Weight	Article No.
Service key	3.4 kg	044303

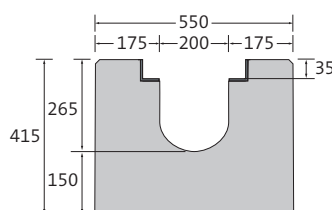
SW = slot width, MW = mesh width, article no. with v = galvanised  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

# BIRCOsolid grid channels | NW 200

The reinforced concrete channel for use with mildly aggressive agents

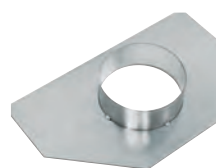
## Channel elements | without internal inbuilt fall

- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Anchor sleeves on the side
- + Fitted with an interior lifting anchor
- + Also available with one-piece hot-dipped galvanised surface protection upon request



Description	Length	Width	Construction height at groove/tongue	Weight	Load class DIN EN 1433	Article No.
Channel No. 0/0	1000 mm	550 mm	415/415 mm	450.0 kg	A 15 – F 900	015201
Channel No. 0/0	1500 mm	550 mm	415/415 mm	680.0 kg	A 15 – F 900	015202
Channel No. 0/0	4000 mm	550 mm	415/415 mm	1800.0 kg	A 15 – F 900	015203

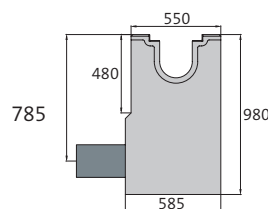
## End caps



Description	Width	For construction height	Weight	Article No.
End cap, galvanised	550 mm	415 mm	3.1 kg	015213
End cap with outlet DN 200, galvanised	550 mm	415 mm	3.6 kg	015211
End cap with outlet DA 225, PEHD, factory assembled	550 mm	415 mm	6.4 kg	015212

## In-line outfall unit | with pipe support | 1-piece

- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + Integrated pipe support for DN 200 connection
- + Without odour trap
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Also available with one-piece hot-dipped galvanised surface protection upon request

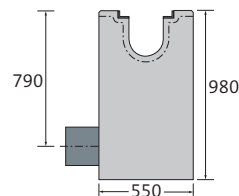


Description	Length	Width at angle/ground	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit	500 mm	550 mm	980 mm	435.5 kg	A 15 – F 900	015235

Exception up to D 400: Not for use across the carriage-way of highways or motorways

**In-line outfall units | with PEHD pipe support | 1-piece**

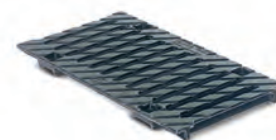
- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + PEHD pipe support DA 225 x 12.8 - SDR 17, length 300 mm
- + Lateral drainage connection
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Also available with one-piece hot galvanised surface protection upon request



Description	Length	Width	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit	500 mm	550/585 mm	980 mm	431.1 kg	A 15 – F 900	015236

**Cast slotted gratings**

- + Black immersion-lacquered
- + 8 point per metre M12/A2 bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	317 mm	35 mm	17.3 kg	SW 200/18 mm	802 cm <sup>2</sup> /m	A 15 – F 900	150278

SW = slot width, MW = mesh width, article no. with v = galvanised  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.



**Hangers for RD 16 piping** | can be mounted externally

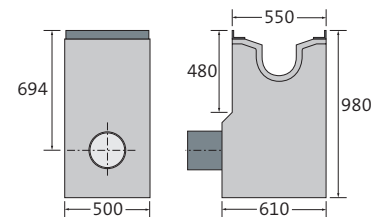
- + Commonly available RD 16 piping hangers are required for laying the concrete parts
- + For safety reasons, simple rope loops may not be used



Description	Weight	Article No.
Hanger RD 16	0.6 kg	606037

**Shut-off outfall unit NW 400** | for channels NW 200 | 1-piece

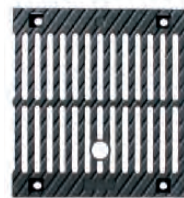
- + 1- or 2-sided channel connection up to NW 400 (on request with end caps / adapter caps for channel connection mounted ex-works)
- + Manually operated valve flap DN 200
- + On request also with electrical or pneumatical valve flap
- + Galvanised silt-bucket
- + PEHD pipe support DA 225x12.8 - SDR 17 (length 300 mm)
- + Pipe support lateral to channel line
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Other outlets on request
- + Not DIBt certificated



Description	Length	Width at angle/bottom	Construction height	Weight	Load class DIN EN 1433	Article No.
Shut-off outfall unit	500 mm	550/610 mm	980 mm	386.1 kg	A 15 – E 600	015439

**Cast slotted gratings** | twofold | for shut-off outfall unit NW 400

- + With key bushing
- + Black immersion-lacquered
- + Including 4-point M16/A2 per grating bolt connection

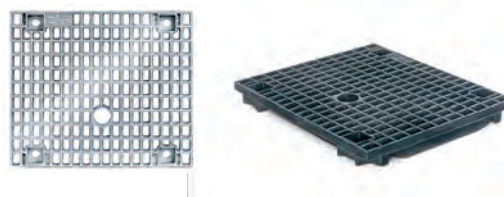


Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	537 mm	45 mm	45.2 kg	SW 190/16 mm	1771 cm <sup>2</sup> /m	A 15 – E 600	150472

SW = slot width  
Exception up to D 400: Not for use across the carriage- way of highways or motorways

**Mesh gratings | cast | for shut-off outfall unit NW 400**

- + With key bushing
- + Black immersion-lacquered or galvanised
- + Including 4-point M16/A2 per grating bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	537 mm	45 mm	44.5 kg	MW 20/30 mm	2310 cm <sup>2</sup> /m	A 15 – E 600	150487
galvanised	500 mm	537 mm	45 mm	47.4 kg	MW 20/30 mm	2310 cm <sup>2</sup> /m	A 15 – E 600	150487v

**Service key**

- + For shut-off outfall unit
- + For manuel operation



Description	Weight	Article No.
Service key	3.4 kg	044303

MW = mesh width, article no. with v = galvanised

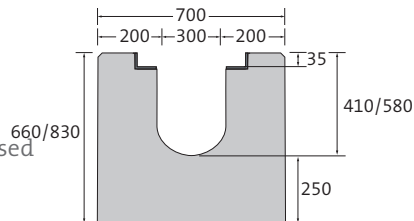
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

# BIRCOsolid grid channels | NW 300

The reinforced concrete channel for use with mildly aggressive agents

## Channel elements | without internal inbuilt fall

- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Anchor sleeves on the side
- + Fitted with an interior lifting anchor
- + Also available with one-piece hot-dipped galvanised surface protection upon request



Description	Length	Width	Construction height at groove/tongue	Weight	Load class DIN EN 1433	Article No.
Channel No. 0/0, construction height 1	1000 mm	700 mm	660/660 mm	820.0 kg	A 15 – F 900	015301
Channel No. 0/0, construction height 1	2000 mm	700 mm	660/660 mm	1640.0 kg	A 15 – F 900	015303
Channel No. 0/0, construction height 2	1000 mm	700 mm	830/830 mm	950.0 kg	A 15 – F 900	015304
Channel No. 0/0, construction height 2	2000 mm	700 mm	830/830 mm	1900.0 kg	A 15 – F 900	015306

## End caps

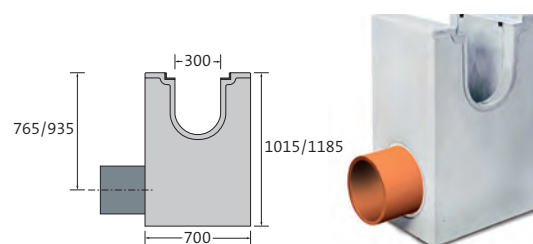


Description	Width	For construction height	Weight	Article No.
End cap for construction height 1, galvanised	700 mm	660 mm	7.1 kg	015340
End cap for construction height 2, galvanised	700 mm	830 mm	9.9 kg	015341
End cap with outlet DN 200 for construction height 1, galvanised	700 mm	660 mm	8.9 kg	015345
End cap with outlet DN 200 for construction height 2, galvanised	700 mm	830 mm	11.7 kg	015346

Exception up to D 400: Not for use across the carriage-way of highways or motorways

**In-line outfall units | with pipe support | 1-piece**

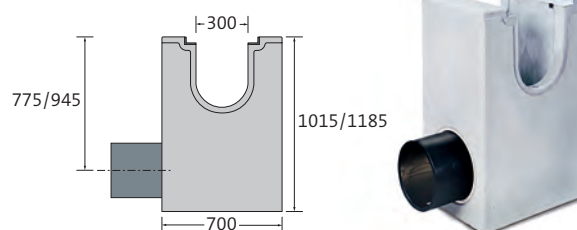
- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + Integrated pipe support for DN 300 connection
- + Without odour trap
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Also available with one-piece hot-dipped galvanised surface protection upon request



Description	Length	Width	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit for construction height 1	500 mm	700 mm	1015 mm	552.0 kg	A 15 – F 900	015338
In-line outfall unit for construction height 2	500 mm	700 mm	1185 mm	632.0 kg	A 15 – F 900	015390

**In-line outfall units | with PEHD pipe support | 1-piece**

- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + PEHD pipe support DA 315 x 17.9 - SDR 17, length 300 mm
- + Lateral drainage connection
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Also available with one-piece hot galvanised surface protection upon request



Description	Length	Width	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit for construction height 1	500 mm	700 mm	1015 mm	564.0 kg	A 15 – F 900	015339
In-line outfall unit for construction height 2	500 mm	700 mm	1185 mm	643.0 kg	A 15 – F 900	015391

**Cast slotted gratings | twofold**

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	417 mm	35 mm	20.4 kg	SW 142/20 mm	1522 cm <sup>2</sup> /m	A 15 – E 600	0150375
galvanised	500 mm	417 mm	35 mm	19.7 kg	SW 142/20 mm	1522 cm <sup>2</sup> /m	A 15 – E 600	0150375v
black	500 mm	417 mm	35 mm	24.9 kg	SW 142/20 mm	1522 cm <sup>2</sup> /m	A 15 – F 900	0150378
galvanised	500 mm	417 mm	35 mm	24.9 kg	SW 142/20 mm	1522 cm <sup>2</sup> /m	A 15 – F 900	0150378v

SW = slot width, article no. with v = galvanised  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

## BIRCOsolid grid channels NW 300

## Mesh gratings | cast

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	417 mm	35 mm	22.9 kg	MW 20/30 mm	1522 cm <sup>2</sup> /m	A 15 – E 600	0150386
galvanised	500 mm	417 mm	35 mm	22.9 kg	MW 20/30 mm	1522 cm <sup>2</sup> /m	A 15 – E 600	0150386v

## Hangers for RD 16 piping | can be mounted externally

- + Commonly available RD 16 piping hangers are required for laying the concrete parts
- + For safety reasons, simple rope loops may not be used



Description	Weight	Article No.
Hanger RD 16	0.6 kg	606037





BIRCOsolid box channel during construction work at the Emden Northern Quay



# BIRCOsolid slot channels |

## Long-lasting Seal – Top Stability

The BIRCOsolid slot channels system ensures a long-lasting seal against liquids like fuels, oils and mild lye and acids. The monolithic reinforced concrete body stands up to extreme loads and significantly reduces installation time and costs.

+ A 15 to F 900



+ WHG Certificate  
No. Z-74.4-62





For drainage of areas subjected to high levels of dynamic horizontal forces. Resistant against mildly aggressive agents.

### BIRCOsolid slot channels | Areas of application

- + Heavily frequented heavy-duty transport areas
- + Container terminals, aircraft operation areas, loading areas
- + Areas in which mildly aggressive liquids can leak, such as petrol stations, lorry loading areas
- + Storage, filling and transferring facilities for water-hazardous substances/Areas subject to water legislation
- + Industrial construction

**BIRCOsolid slot channels | Facts**

- + Slot channels system: Profile 200/300 without inbuilt falls
- + Officially certified (No. Z-74.4-62)
- + Interrupted slot
- + Made of constructively reinforced C 40/50 concrete
- + Construction length: 4.0 metres
- + Load class: A 15 – F 900
- + Outfall units with outstanding drainage performance
- + Removable cast grating cover for easy inspection of the sealing joint

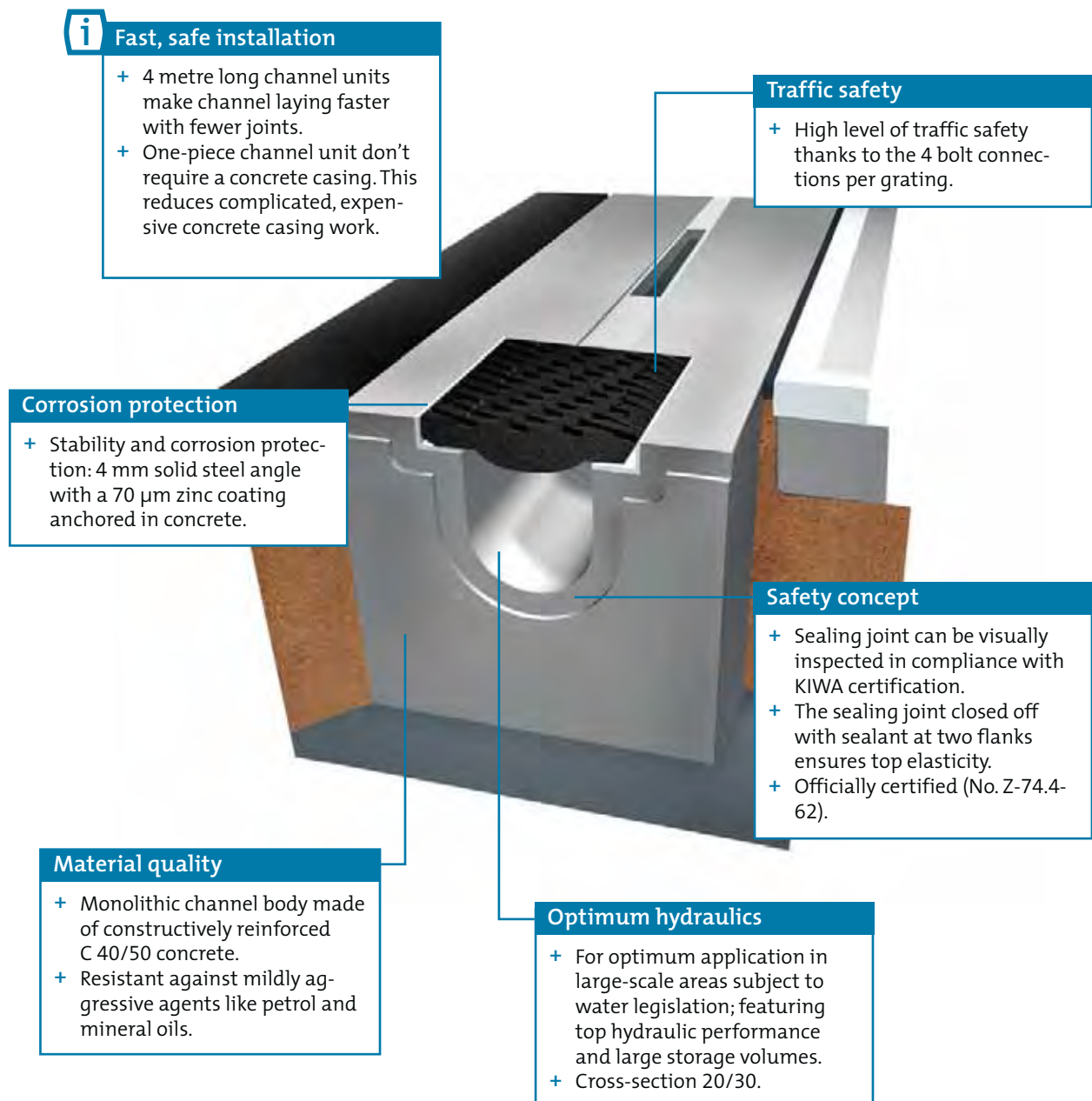




# BIRCOsolid slot channels

## Long-lasting Seal – Top Stability

BIRCOsolid reinforced concrete slot channels are ideal for use anywhere that is subjected to extreme loads where groundwater protection is required.



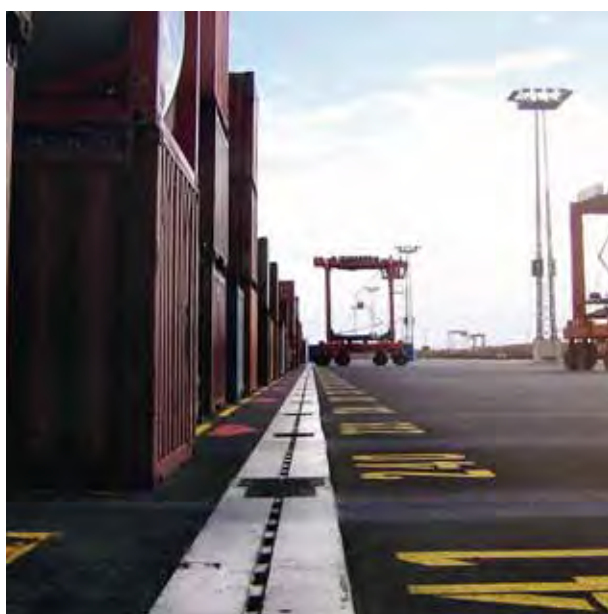
## Logport Duisburg – Tailor-made special lengths



The Logport 1 container terminal/shipping terminal in Duisburg is a combined terminal where ships and lorries load and unload. A heavy-duty area here for reach stackers that continuously handles the high-level horizontal loads and point loads is fitted with the BIRCOsolid slot channel

profile 200/300. The system was laid in the port's heavy-duty area and in the areas subject to water legislation, covering total space of some 1,100 m. BIRCO created special lengths to accommodate the grate joints between the concrete plates.

## Eurogate – Water legislation-compliant and tough enough for heavy loads



Europe's fourth-largest container port is located in Bremerhaven and is home to 10 docks for large container ships spread over a 3.2 kilometre stretch. BIRCOsolid slot channel profile 200/300 was laid to provide safe drainage for the terminal that complies with heavy-duty regulations and the WHG legislation. Outfall units and shut-off outfall units were added as needed. The appeal of this building plan lies in the top drainage of extreme loads and accruing surface water, as well as in the significant time and money savings for installation thanks to the 4 m standard lengths of the channel units.

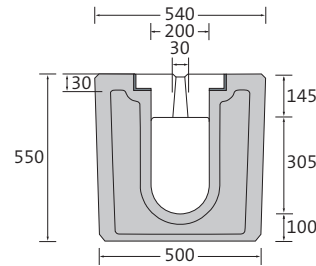


# BIRCOsolid slot channel

The reinforced concrete channel for use with mildly aggressive agents

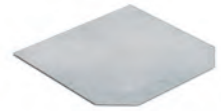
**Slot channel element** | without internal inbuilt fall | cast slotted grating class F 900

- + Monolithic concrete body
- + Interrupted slot, slot width 30/50 mm
- + With cast honeycomb grating (500/287/30, MW 20/75 mm)
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint
- + Special lengths available upon request
- + Laying spade available upon request



Description	Length	Width at angle/ ground	Construction height	Weight	Inlet cross section	Load class DIN EN 1433	Article No.
Profile 200/300	4000 mm	540/500 mm	550 mm	2365.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	015503

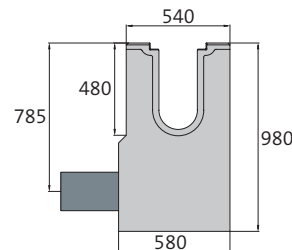
## End cap



Description	Width	Für Construction height	Weight	Article No.
End cap, galvanised	500 mm	550 mm	5.7 kg	015540

**In-line outfall unit for slot channel** | with pipe support | 1-piece

- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + Integrated pipe support for DN 200 connection
- + Without odour trap
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint

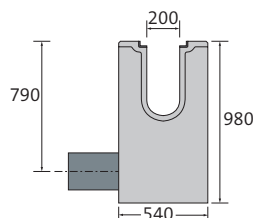


Description	Length	Width at angle/groundt	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit	500 mm	540/580 mm	980 mm	430.0 kg	A 15 – F 900	015536

Exception up to D 400: Not for use across the carriage- way of highways or motorways.

**In-line outfall unit for slot channel | with PEHD pipe support**

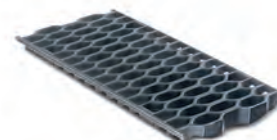
- + 1- or 2-sided channel connection
- + Galvanised silt bucket
- + PEHD pipe support DA 225 x 12.8 SDR 17, length 300 mm  
(PEHD pipe support DA 160 and DA 315 on request)
- + Lateral drainage connection
- + With hot-dipped galvanised solid steel angle  
for combi-closure system
- + Visible sealing joint
- + On request also as shut-off outfall unit



Description	Length	Width	Construction height	Weight	Load class DIN EN 1433	Article No.
In-line outfall unit	500 mm	540 mm	980 mm	435.0 kg	A 15 – F 900	015537

**Honeycomb gratings | cast**

- + Black immersion-lacquered
- + 8 point per metre M12/A2 bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	287 mm	35 mm	14.5 kg	MW 20/75 mm	1640 cm <sup>2</sup> /m	A 15 – F 900	150280

SW = slot width

Exception up to D 400: Not for use across the carriage- way of highways or motorways.

# BIRCOsolid | Installation Instructions

A number of details must be observed when installing BIRCOsolid box and slot channels. Here is a general description.

To guarantee smooth operation and compliance with the requirements in accordance with DIN EN 1433, the following general valid installation instructions must be observed:

1. Prior to installation, the correct load class in accordance with DIN EN 1433 must be selected.
2. **Thanks to the high level of stability, laying the BIRCOsolid channels is conducted on an earth-moist C 25/30 / C 30/37 concrete strip (with grid channels at least 15 cm high; with slot channels at least 70 cm high) which must be tapered in a conical shape on both sides. No encasing or reinforcement on the sides is necessary.**
3. The channel parts may only be positioned or transported on the laying sleeves/laying spades designed for this purpose. The corresponding special hangers/laying spades can be purchased from BIRCO. A cross-beam is to be used when moving in order to avoid a diagonal pull of the steel cable.
4. **All adjoining pavement surfaces must run permanently at a level of some 3 to 5 mm higher than the upper edge of the channel.** A 10 mm joint must be provided with pavement or plate coverings to avoid flaking in the edge area. In order to achieve this, we recommend laying the first two to three rows of pavement surfacing in the mortar bed.
5. For installation in concrete surfaces or reinforced concrete constructions, running joints must be provided on both sides to compensate horizontal forces that emerge. In sealing the adjacent areas it must be ensured that there is no mechanical damage to the channel units. Joints running diagonally to the channel line must be arranged every 4 – 6 metres in the adjacent concrete surfaces (in-situ concrete) so that they run through a channel end.

6. BIRCOsolid drainage units are to be fitted with a sealing joint at the channel joint. The sealing joint must be

grouted with jointing material (such as BIRCOplast) in accordance with the official water legislation-related approval certification (see also page 79).

7. Proceed analogously when installing the outfall units.

8. Local particularities can require special installation methods that have to be examined and taken into account by the planner(s). The installation must comply with the latest regulations and guidelines such as ZTVT, ZTV concrete, ZTV bit and RStO. In addition, the requirements according to the official building authority approval regarding installation, verification and maintenance additionally apply.

## Additional requirements:

- + The laying and sealing work must be conducted by an authorised company specialising in such work (in accordance with regulation on facilities for handling water-hazardous substances §3). In addition to these installation instructions, also observe the technical details (jointing) and the usage instructions on the BIRCO-Primer and BIRCOplast containers.
- + Construction in accordance with the Construction Tendering and Contract Regulations (VOB) Part C, DIN 18318 "Transport Route Construction".
- + Additional technical regulations and guidelines for pavement surfaces in road construction (ZTVT-StB) and ZTV Asphalt.
- + Additional technical regulations and guidelines for ground work in road construction (ZTVE-StB).
- + Guidelines for the standardisation of the pavement of public thoroughfares (RStO).
- + Preparation of the ATV DIN 18299 performance description "General Regulations for Construction Work of all Types".

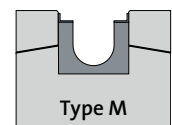


### Distinction between 2 types

- + **Type I:** Requires no load-bearing foundation and/or no encasing: for example BIRCOsolid grid channel.
- + **Type M:** Requires a load-bearing foundation and/or encasing: for example BIRCOprotect.



Type I



Type M

# Installation instructions in accordance with DIBt certification

**Installation instructions for traffic areas where substances accrue that are hazardous to water.**  
**Fuel depots | Extinguishing-water collection points | Chemical companies | Storage, filling and transferring facilities for water-hazardous substances**

## General information

1. The installation of BIRCOsolid may in Germany only be conducted by companies that specialise in such activities in accordance with Regulation on facilities for handling water-hazardous substances §3. These companies, including their personnel, must have been trained to do such work by an authorised institution. Specific national requirements must be verified locally.
2. The installation of BIRCOsolid requires compliance with BIRCO's installation and processing instructions. The requirements specified in the general WHG certification regarding installation, maintenance and verification must be observed to the letter.
3. The installation of the channel systems must be conducted from on the basis of engineering considerations. Construction documentation must be prepared. The design of any facilities for storing, filling and transferring liquids hazardous to water must take the respectively applicable water legislation provisions governing drainage and the control of precipitation water into account.  
 The requirements from other legal sectors (e.g., work safety, hazardous materials legislation, the German Ordinance on Industrial Safety and Health) remain unaffected and in full effect.
4. Liquids hazardous to water that have escaped must be recognised as quickly as possible, in any case no later than within 72 hours, and removed from the channel systems. Transferring and filling procedures must always be visually monitored for leakages. Should leakages be discovered, measures to eliminate them must be undertaken.
5. The channel systems must be cleaned of dirt and collected mixtures of dirt and liquids hazardous to water. Cleaning of the channel systems also includes cleaning of the outfall units or silt buckets.
3. The joints between pre-fabricated parts of the channel systems and between pre-fabricated parts and the surfaces to be sealed must be grouted using a joint sealing system that has general official certification or which is technically certified in Europe for the intended purpose.
4. Prior to laying the pre-fabricated parts, it must be established that the documentation corresponds with the requirements.
5. The pre-fabricated parts must be laid flush onto the concrete base layer.
6. Damaged concrete pre-fabricated parts may not be used.
7. When applying joint sealant, it must be ensured that there is a sealant connection between diagonal joints and longitudinal joints.
8. When laying pre-fabricated parts, drawings verifying the correct assembly are to be prepared by the construction supervisor or his/her representative.

## Regulations for use, upkeep and maintenance

1. We refer expressly here to the necessity for operators of facilities for the storage, filling and transfer of substances that can be hazardous to water to conduct constant monitoring of the seal tightness, respectively, the functionality of the pre-fabricated parts in accordance with Regulation on facilities for handling water-hazardous substances §1.
2. After each contact with hazardous agents, the channel systems must first be visually inspected in regard to their functionality. If necessary, additional measures must be undertaken.
3. The operator of the facility is obligated to appoint only such companies to conduct maintenance, repair and cleaning of the pre-fabricated parts as are specialist businesses as defined by Regulation on facilities for handling water-hazardous substances §3 and which are referred for such work by the manufacturer, unless the required work is exempted from this obligation in accordance with applicable state legislative provisions.
4. The general maintenance instructions contained in the BIRCOsolid grid channels/slot channels installation instructions continue to apply.

## Installation

1. The installation instructions contained in the general DIBt certification, respectively, in the installation instructions prepared by BIRCO, must be complied with. System components may not be replaced with components that are not part of the system.
2. Installation must be conducted in accordance with the construction drawings, respectively, with the installation instructions. Particularities of the location can require special types of installation which must be examined and taken into account by the planner(s).



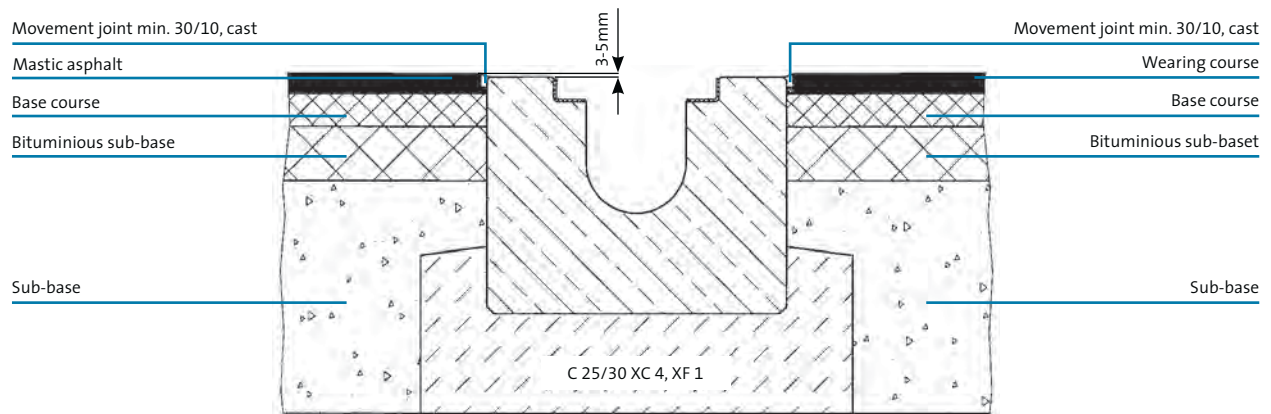
## BIRCOsolid grid channels – Installation Examples

Installation instructions for heavy-duty transport areas with frequent traffic.

Logistics centres | Transport hubs | Vehicle manoeuvring | Aircraft pavements

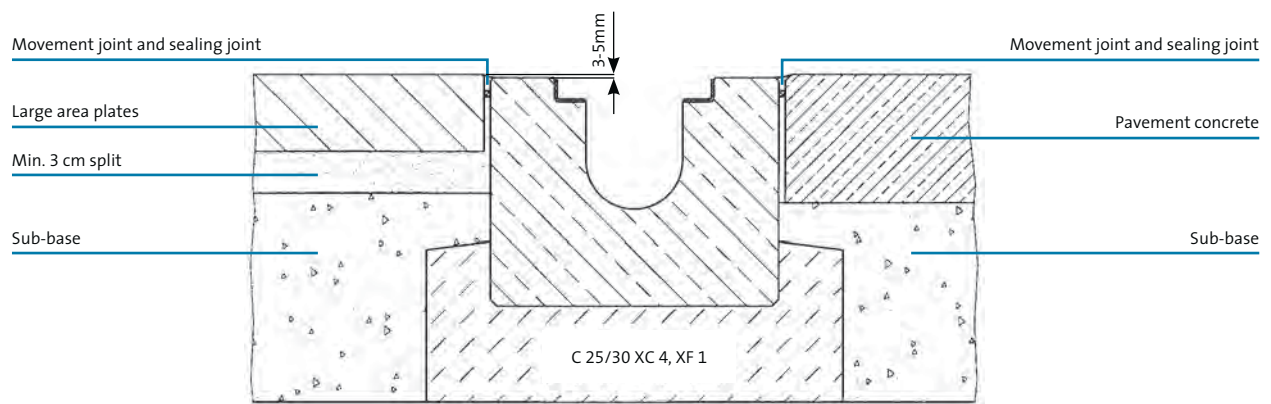
Up to class F 900, Type I, NW 150 - 300

Drawing No. 6687



Up to class F 900, Type I, NW 150 - 300

Drawing No. 6687



When pavement surfaces are being laid and pressed, it must be ensured that the pavement material is not forced against the concrete units.

BIRCOsolid must be embedded on a concrete bed (min. C 25/30 XC 4, XF 1) at least 15 cm thick. Overhang on the side must be at least 10 cm. The subgrade must be sealed with an  $EV_2$  of  $> 45$  N/mm if the concrete bed maintains an overhang of  $> 50$  cm at the end of the channel. Otherwise, an  $EV_2$  of  $> 180$  N/mm must be maintained or it must be ensured that a distance of  $> 50$  cm to the end of the channel is maintained when lorries drive over the channel.

### Bolting instructions:

Torque moments for fastening of the gratings are to be set at M12 = 60 Nm, M16 = 100 Nm. The bolts on the gratings must be retightened at regular intervals.

Constructed in accordance with RSTO using non-settling frost-free sub-bases.

See Page 76 for installation dimensions.

Exception starting with D 400: not for installation diagonally to the road for motorways and expressways.



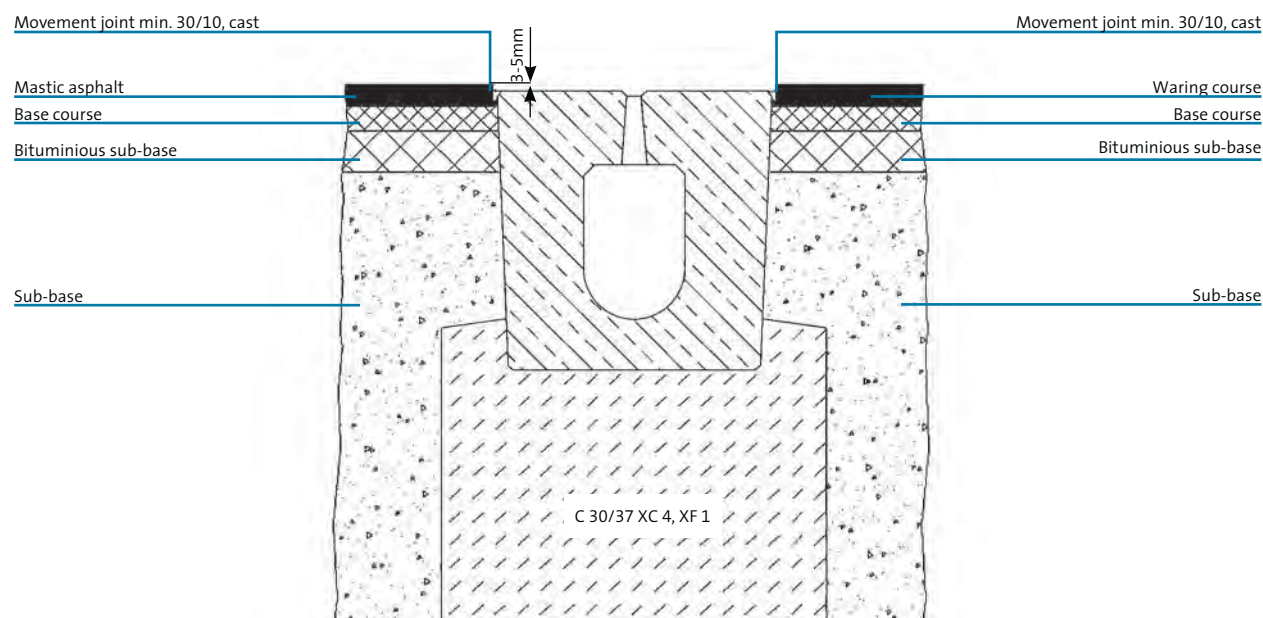
## BIRCOsolid slot channels – Installation Examples

Installation instructions for heavy-duty transport areas with frequent traffic.

Logistics centres | Transport hubs | Vehicle manoeuvring | Aircraft pavements

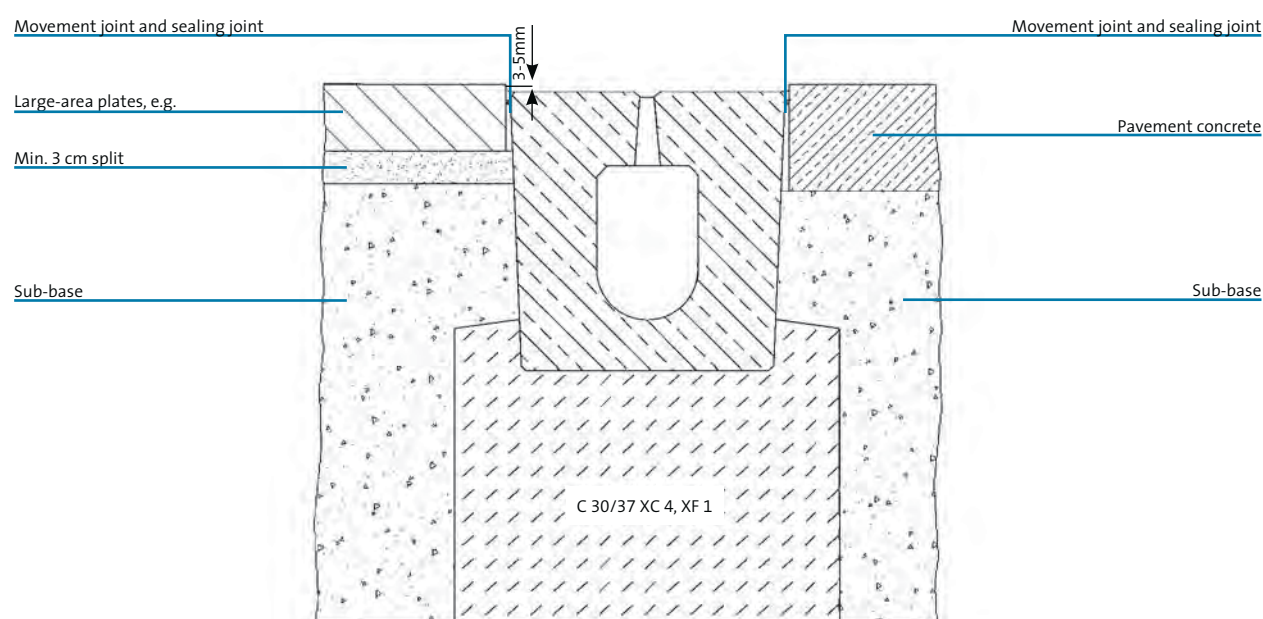
Up to class F 900, Type I

Drawing No. 8742



Up to class F 900, Type I

Drawing No. 8742



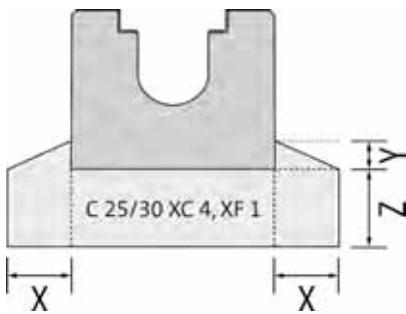
Constructed in accordance with RSTO using non-settling frost-free sub-bases.  
See Page 76 for installation dimensions.  
Exception starting with D 400: not for installation diagonally to the road for motorways and expressways.

## BIRCOsolid overview

The manufacturer's installation instructions must be followed in order to comply with the requirements stipulated by DIN EN 1433. The requirements according to the official certification by DIBt apply in regard to installation, verification and maintenance.

### BIRCOsolid

NW	Type	Load class	X	Y/Y 1	Y 2	Z	Drawing No.	Page
BIRCOsolid 150	I	D 400 – F 900	≥ 100	≥ 150	–	≥ 150	6687	74
BIRCOsolid 200	I	D 400 – F 900	≥ 100	≥ 150	–	≥ 150	6687	74
BIRCOsolid 300	I	D 400 – F 900	≥ 100	≥ 150	–	≥ 150	6687	74
BIRCOsolid slot channel	I	D 400 – F 900	≥ 125	≥ 100	–	≥ 700	8742	75



Installation without concrete surround

## BIRCOsolid Drainage capacities

BIRCO channel systems provide outstanding drainage performance. BIRCO offers a calculation service in addition to this diagram.

### BIRCOsolid NW 150

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	12.66 l/sec*	227.86 cm²

### BIRCOsolid NW 200

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	22.39 l/sec*	403.08 cm²

### BIRCOsolid NW 300

	Drainage capacity at the channel end	Cross-sectional area at the channel end
Construction height 1	55.5 l/sec*	999.34 cm²
Construction height 2	83.2 l/sec*	1479.38 cm²

### BIRCOsolid slot channel

	Drainage capacity at the channel end	Cross-sectional area at the channel end
Profile 200/300	31.3 l/sec*	563.0 cm²

\*Safety factor  $\nu = 1.2$

The tables can only give guidelines for the dimensioning. On-site conditions such as position of the manholes already installed, number of channel lines etc. cannot and have not been taken into account. We therefore recommend making use of our hydraulic calculation service which provides you with a draft proposal.

## Hole drilling horizontal and vertical

We can fit BIRCOsolid channels with horizontal or vertical bore holes for directly fitting feed and drainage lines according to your plans. The connections available differ according to the nominal widths, ranging from DN 150 to DN 300. The diameters are matched with channel base pipes;

different pipes are available upon request. Upon request the design of the pipe connection can also be supplied with double walls. Standard components from specialist retailers are also available for the junction between the sealed PE pipe and stoneware or PVC pipe.

### BIRCOsolid

NW	Bore hole horizontal, maximal	Bore hole, vertical, maximal
Grid channel 150 mm	DN 150	DN 150
Grid channel 200 mm	DN 150	DN 200
Grid channel 300 mm	DN 300	DN 300
Slot channel Profile 200/300	DN 150	DN 200

Bore holes must be a distance of at least 100 mm away from the end of the channel.

## Everything for jointing – Information

Look here to find a comprehensive description of jointing the channel joints and of cleaning and maintenance.

### Sealants, tools

We supply everything you need to guarantee seal tightness and system safety for BIRCOsolid. This also includes a complete program with filler cord, special primers, jointing

materials and a preparation set. BIRCO customers profit from complete solutions that are genuinely complete.

#### Sealants

- + **BIRCO-Primer K1** for non-absorbent surfaces such as glass, enamel, stainless steel, galvanised steel, ceramic tiles, etc.
- + **BIRCO-Primer K2** for absorbent surfaces such as concrete, autoclaved aerated concrete, stone, plaster, etc.
- + **BIRCOplast**, is a dual-component, permanently elastic polysulfide-based sealant mass that is resistant to mineral oil and fuels
- + **PE-cord**

#### Tools

- + Tool cleaner
- + Hand mixer
- + Grouting gun
- + Spiral stirrer
- + **Work Set** includes a grouting gun with 3 nozzles, hand mixer (stand pipe and foot), spiral stirrer

## Material requirements diagram

### For the channel joint

NW	Construction length	Cord length	BIRCOplast	BIRCO-Primer K2
150	1 m	723 mm	133.0 ml	15 ml
150	1.5 m	723 mm	133.0 ml	15 ml
150	4 m	723 mm	133.0 ml	15 ml
200	1 m	920 mm	169.0 ml	19 ml
200	1.5 m	920 mm	169.0 ml	19 ml
200	4 m	920 mm	169.0 ml	19 ml
300 Ch 1	1 m	1305 mm	294.0 ml	39 ml
300 Ch 1	2 m	1305 mm	294.0 ml	39 ml
300 Ch 2	1 m	1645 mm	371.0 ml	49 ml
300 Ch 2	2 m	1645 mm	371.0 ml	49 ml
Slot channel	4 m	1269 mm	286.0 ml	39 ml

### For the one-sided channel longitudinal joint\* per metre

NW	Construction length/ Cord length	BIRCOplast	BIRCO-Primer K1/K2
150	1 m	256.0 ml	20 ml
150	1.5 m	384.0 ml	30 ml
150	4 m	1024.0 ml	80 ml
200	1 m	256.0 ml	20 ml
200	1.5 m	384.0 ml	30 ml
200	4 m	1024.0 ml	80 ml
300 Ch 1	1 m	537.0 ml	30 ml
300 Ch 1	2 m	1074.0 ml	60 ml
300 Ch 2	1 m	537.0 ml	30 ml
300 Ch 2	2 m	1074.0 ml	60 ml
Slot channel	4 m	1748.0 ml	80 ml

\* With NW 100, 150: groove width 10 mm, groove depth 55 mm, sealant depth 40 mm, with NW 200: groove width 10 mm, groove depth 60 mm, sealant depth 45 mm and with NW 300, 400: groove width 10 mm, groove depth 70 mm, sealant depth 55 mm

## Jointing with BIRCOplast

### Jointing the channel joints | Two-flank adhesion

#### A secure seal

**BIRCOsolid** is manufactured from Class C 40/50 / C 30/37 concrete. The system panels are produced already fitted with a channel joint that has to be filled with sealant in accordance with the official DIBt certification. This ensures that no liquids contaminate the ground and groundwater. The sealing joint's special shape and the execution of the jointing work as described below allow for a better completed seal that complies with the jointing requirements of Data Sheet No. 6 from the IVD ('German Industrial Sealant Association'): two-flank adhesion.

The connecting joint between two channels is preferably back-filled with a PE cord. The back-filling material has to provide sufficient resistance once it has been installed and

the sealant is applied. This is why its diameter should be approximately 1/3 larger than that of the joint width.

The PE filling cord is required for the following reasons:

- + Avoiding three-flank adhesion
- + Restricting the joint depth

This process and jointing method are known from other operations including petrol station construction. (Sealing ground joints with elastic sealants in areas subject to vehicle traffic at petrol station filling facilities – On this refer also to IVD Data Sheet No. 6.)

### Jointing with BIRCOplast



1. Channel groove at the tongue – prior to jointing



2. Preliminary priming



3. Inserting the PE sealing cord



4. Mixing the joint sealant



5. Applying the joint sealant



6. Smoothing the surface of the sealed joint

### Conducting Jointing Work

The first step is to inspect the moisture content of the concrete components. It must be ensured that the adhesive surfaces are sufficiently dry for the sealant to form a proper bond, so no jointing work may be conducted during rain or the day after a rainy day. The temperature of the adhesive surface may not be below + 5° C and may not exceed + 40° C.

#### Procedure:

- Tape off the joint edges
- Pre-treat the adhesive surfaces with BIRCO-Primer K1 or K2
- Insert the round PE cord to avoid three-flank adhesion

BIRCO-Primer K1 for non-absorbent surfaces (angles, metal, etc.), BIRCO-Primer K2 for absorbent surfaces (channel, concrete, etc.). BIRCOplast may only be used in combination with the appropriate primer. The primer must be applied onto the joint flanks in an even, equally distributed layer with no empty spaces. When using a brush to apply the primer, ensure that concrete pores are sufficiently treated and filled completely; the primer film cannot be allowed to tear over slightly raised areas. The primer may also be applied with suitable spraying devices.

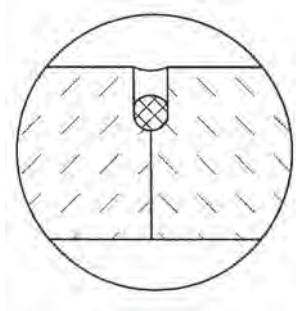


## Comparison of two-flank / three-flank adhesion

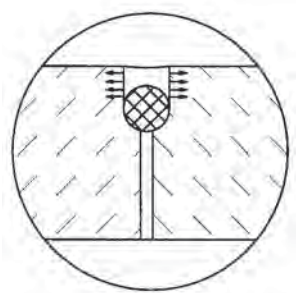
Work materials expand or contract due to temperature fluctuations, but the sealant only allows for maximum

expansion of 25%. If this value is exceeded, the material tears.

### Two-flank adhesion

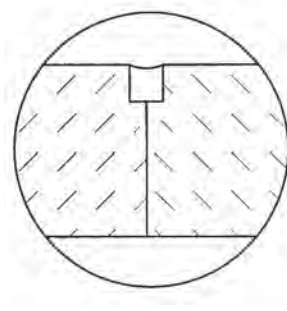


With two-flank adhesion, the jointing material is only connected with the concrete on two sides above the inserted round PE cord. This ensures the full elasticity of the sealant.

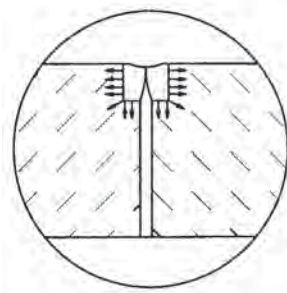


This means that local settling and temperature-related expansion can be compensated.

### Three-flank adhesion



With three-flank adhesion, the jointing material is connected with the concrete on three sides. Movement of the channels toward each other cannot be compensated in this way.



The jointing material can tear away from the lower flank.

## Sealing work qualifications

In accordance with the provisions of the WHG and the presiding authorities, jointing work must be conducted by a company specialising in such work in accordance with Regulation on facilities for handling water-hazardous substances, respectively, by a company authorised to conduct

such work by the sealant manufacturer. This applies for all situations where the work is subject to German law. (A list of authorised jointing companies is available from BIRCO.) Specific national requirements must be verified locally.

## Seal along the length of the channel

It is necessary to seal the junction between the channel and the pavement below the edge angle. When sealing the length of the channel, it must be ensured that the connection of the joint to be sealed is deep enough. This joint

must be so deep that once the filling cord has been inserted the sealant sufficiently covers and subsequently seals the junction from the channel to the edge angle.

## Jointing bore hole connections

In order to ensure a tight seal, the pipe connection and the channel joints have to be jointed with BIRCOplast:

- + Position the laminated PE pipe in the bore hole
- + Use the PE cord as a centring aid and insert it in a ring shape for sealing
- + Treat the channel with BIRCO-Primer K2
- + Treat the PE pipe with BIRCO-Primer K1
- + Allow the primed surfaces to air out
- + Mix BIRCOplast and fill the joint

Jointing channels that have already been installed is an ideal situation, but the drainage pipe should be positioned prior to installation of the channels. A PVC pipe where the surface has been roughened can be sealed in the same way.

## Load capacity of the sealant

At 23° C, BIRCOplast's curing time is around 24 hours. After this period has elapsed, the joint seal is capable of bearing loads and can be subjected to rolling traffic. In this regard,

please also observe the instructions that come with the jointing material and in the Safety Data Sheet.

## Maintenance and repair

Sealing in the traffic area at petrol stations is intended to prevent automobile-related substances that are hazardous to water from making their way into surface water, any wastewater facilities or the ground. Inspection and maintenance on a regular basis is necessary for ensuring the long service life of the seal system. It is therefore necessary to conclude a maintenance contract. According to Regulation on facilities for handling water-hazardous substances §62 and 63, such facilities that are located within the jurisdiction of German civil law may only be installed, constructed, maintained and repaired by companies specialising in such

work. The qualification parameters for such a specialist company are precisely defined in the WHG.

To the extent that German civil law has no jurisdiction, the customer must clarify whether identical or similar regulations must be complied with and observed regarding the qualifications of the company conducting the laying work. In any case, inspection and maintenance conducted on a regular basis and secured by a maintenance contract are necessary.

## Filling-point concrete surfaces that must be sealed

A petrol station's filling-point is a separate area (operating area). The area contains the automobile-related substance filling facilities.

The separation of the filling point to the adjacent areas is created by:

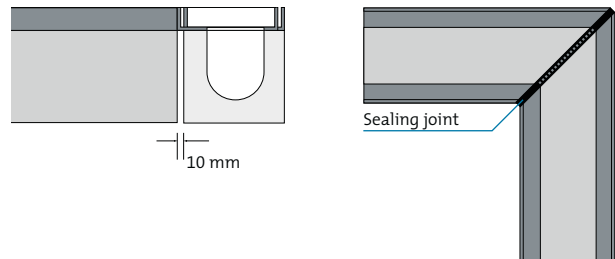
- + Channels (open or covered)
- + Upturn beams
- + Slope changes



## Additional installation information: BIRCOsolid jointing possibilities

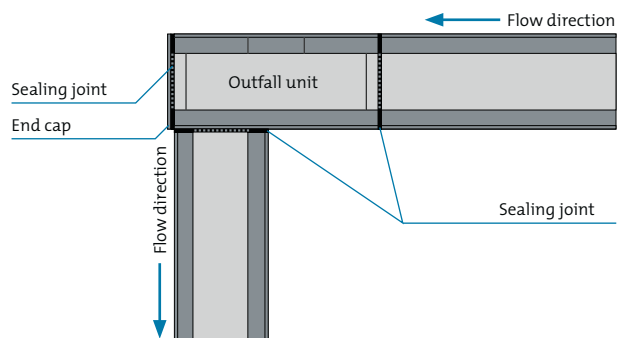
### Corner solution using a mitre cut

This mitre cut is jointed in the accustomed procedure, so the mitre must have a gap of 10 - 14 mm held in place on a mitre piece by a spacer. The PE cord is pushed into this gap in such manner that a filling depth of approximately 10 mm is retained for the plastic.



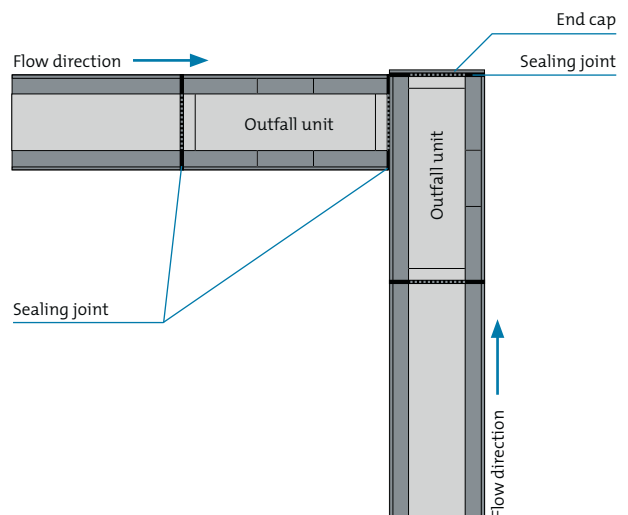
### Corner solution with in-line outfall units

The drainage of a channel line is conducted here via an in-line outfall unit at the end of the channel. An additional line is pressed up against the side of the outfall unit. The gap that emerges is jointed in the accustomed procedure with sealant for BIRCOsolid. A connection to the in-line outfall unit from the side of the channel is inadvisable, since this would generate significant costs for special design production.



### Drainage with two in-line outfall units as a corner solution

The outfall units are pressed up against one another with a gap of 7 mm. Jointing is conducted in the accustomed procedure.

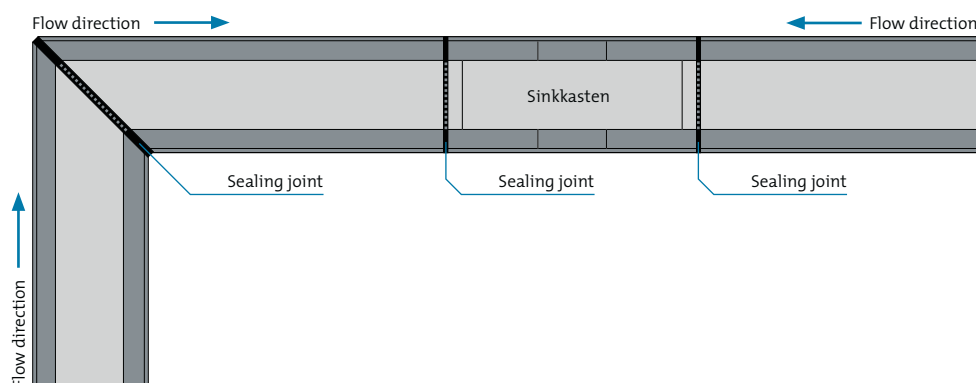


## Additional installation information: BIRCOsolid

### Drainage with two drainage lines in one outfall unit

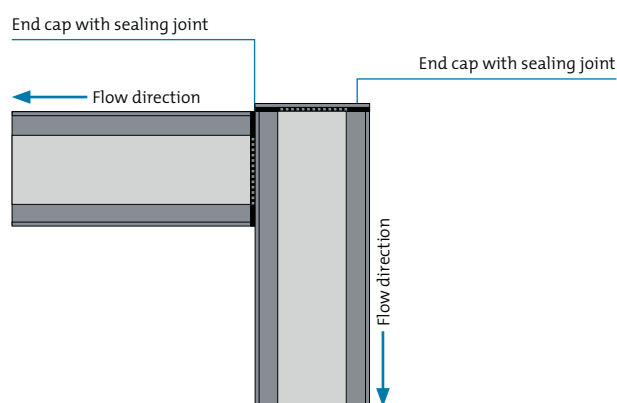
In-line outfall units are generally fitted with connection openings on two sides. BIRCOsolid in-line outfall units are available with connection heights of 0/0, 5/0 and 10/0.

For one-sided channel connection, the second connection opening can be closed with an end cap and sealed.



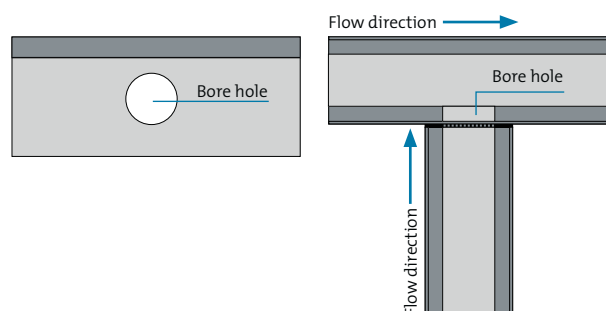
### Attaching end caps

For proper sealing, the front sides of channels and outfall units must be cleaned and capable of bearing loads and the end caps must be cleaned of all oils and greases and roughened at the points of adhesion. BIRCO-Primer K1 must be applied to the end cap and BIRCO-Primer K2 must be applied to the concrete contact surface. Once this has dried, a layer of BIRCOplast that is approximately 5 mm thick must be applied with a putty knife to the concrete contact surface. The end cap is placed onto this and evenly pressed into it so that BIRCOplast comes out of the sides of the connection points. There must be a minimum adhesion thickness of 2 mm. The front walls must be fixed for 24 hours. The material squeezing out from the sides is then smoothed out with a putty knife on the external and internal surfaces.



### Channel T-connections

For this, a bore hole is drilled into the side of a channel (diameter of the hole corresponds with the incoming channel profile). The incoming channel is placed at the drilled channel at a distance of 7 mm. With the 5 mm deep pre-shaped channel groove, a 10 mm wide gap emerges which is then jointed in the accustomed procedure.



# BIRCOsolid slot channels |

## Pfuhler System Z – Type K

Type K BIRCOsolid slot channels Pfuhler System Z are ideal for busy heavy-duty traffic areas and also meet the requirements for the drainage of mildly aggressive agents. Even in the event of an accident, liquids posing a threat to water can be diverted and stored thanks to the slot channels' large storage volume.

+ A 15 to F 900



+ WHG Certificate  
No. Z-74.4-46



Drainage for areas with extreme dynamic horizontal forces. Resistant against mildly aggressive agents.



### BIRCOsolid slot channels Pfuhler System Z – Type K | Areas of application

- + Heavy-duty load areas with heavy traffic
- + Container terminals, aircraft operation areas, loading areas
- + Areas in which mildly aggressive liquids can leak, such as petrol stations, lorry loading areas
- + Storage, filling and transferring facilities for water-hazardous substances/Areas subject to water legislation



**BIRCOsolid Schlitzrinnen Pfuhler System Z – Type K** | Facts

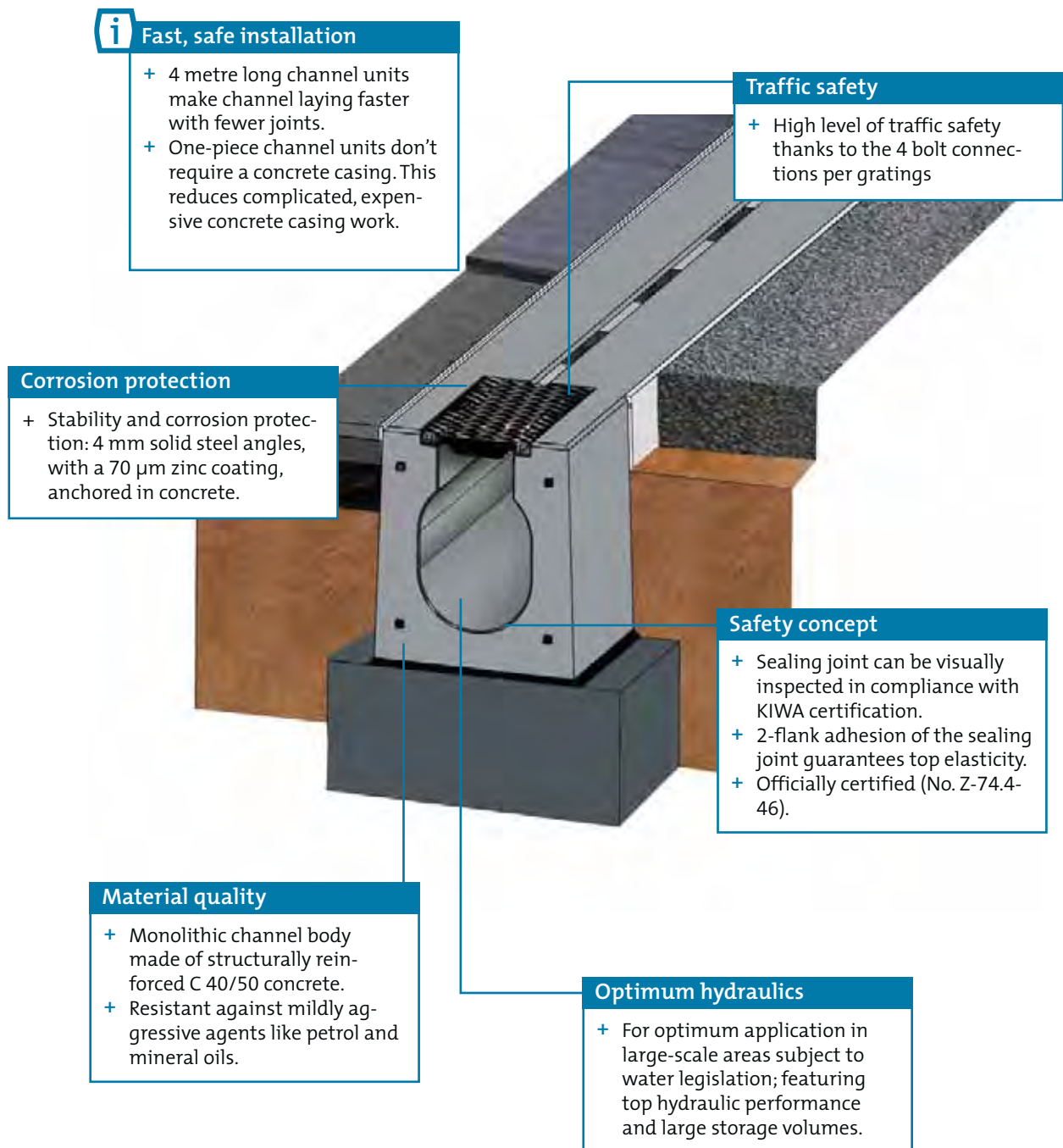
- + Slot channel system: DN 300, profile 300/400, with and without inbuilt falls
- + Official certification (No. Z-74.4-46)
- + Interrupted slot
- + Channels with outlets
- + Made of constructively reinforced C 40/50 concrete
- + Standard construction length: 4.0 metres
- + Load class: A 15 – F 900
- + Removable cast grating cover for easy inspection of the sealing joint



# BIRCOsolid slot channels

## Pfuhler System Z – Type K

Designed for installation in extremely busy traffic areas that require effective groundwater protection.



## Rhenus Gießen – For every need and demand



A new drainage solution concept was needed for the expansion of the Rhenus location in Gießen. A channel drainage system was required that could stand up to the loads in extreme heavy-duty transport areas, was equipped with an optical maintenance joint and that ensured a tight seal against liquids like fuels, oils, mild lye and acids. BIRCOsolid Pfuhler System Z – Type K has an inspection opening in

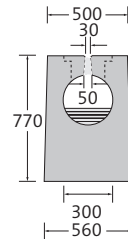
each channel unit with slotted cast gratings compatible for everything up to load class F 900. The removable slotted cast grating on the channel end enables quick, easy maintenance and optical inspection of the sealing joint at any time and without any tools. And the construction length of 4 m per component saved time and reduced expensive installation work.

# BIRCOsolid slot channels

## Pfuhler System Z – Type K DN 300

**Slot channel elements** | with 0.5% internal inbuilt fall | **Class D 400**

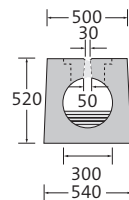
- + Monolithic concrete body
- + Interrupted slot, slot width 30/50 mm
- + With cast honeycomb grating (500/287/30, MW 20/75 mm)
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint



Description	Length	Width at top/bottom	Construction height	Weight	Inlet cross section	Load class DIN EN 1433	Article No.
Channel No. 1	4000 mm	500/560 mm	770 mm	3240.0 kg	239 cm <sup>2</sup> /m	A 15 – D 400	035230501
Channel No. 2	4000 mm	500/560 mm	770 mm	3270.0 kg	239 cm <sup>2</sup> /m	A 15 – D 400	035230502
Channel No. 3	4000 mm	500/560 mm	770 mm	3310.0 kg	239 cm <sup>2</sup> /m	A 15 – D 400	035230503
Channel No. 4	4000 mm	500/560 mm	770 mm	3355.0 kg	239 cm <sup>2</sup> /m	A 15 – D 400	035230504
Channel No. 5	4000 mm	500/560 mm	770 mm	3405.0 kg	239 cm <sup>2</sup> /m	A 15 – D 400	035230505

**Slot channel elements** | with 0.5% internal inbuilt fall | **Class F 900**

- + Monolithic concrete body
- + Interrupted slot, slot width 30/50 mm
- + With cast honeycomb grating (500/287/30, MW 20/75 mm)
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint



Description	Length	Width at top/bottom	Construction height	Weight	Inlet cross section	Load class DIN EN 1433	Article No.
Channel No. 1	4000 mm	500/540 mm	520 mm	2000.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035230801
Channel No. 2	4000 mm	500/540 mm	520 mm	2030.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035230802
Channel No. 3	4000 mm	500/540 mm	520 mm	2070.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035230803
Channel No. 4	4000 mm	500/540 mm	520 mm	2115.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035230804
Channel No. 5	4000 mm	500/540 mm	520 mm	2165.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035230805

We reserve the right to make technical or other changes even without prior notification.  
 Class D 400 = Slot channels can be installed without a load-bearing foundation.  
 Class F 900 = Slot channels must be installed with a load-bearing foundation.  
 Special lengths and laying spades available upon request.



**Slot channel element** | without internal inbuilt fall | Class D 400

- + Monolithic concrete body
- + Interrupted slot, slot width 30/50 mm
- + With cast honeycomb grating (500/287/30, MW 20/75 mm)
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint

Description	Length	Width at top/bottom	Construction height	Weight	Inlet cross section	Load class DIN EN 1433	Article No.
Channel	4000 mm	500/560 mm	770 mm	3235.0 kg	239 cm <sup>2</sup> /m	A 15 – D 400	035230526

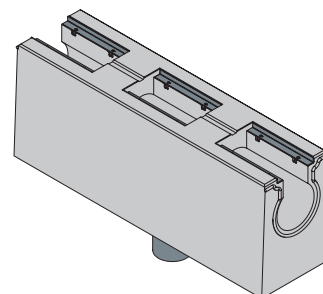
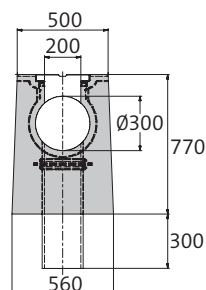
**Slot channel element** | without internal inbuilt fall | Class F 900

- + Monolithic concrete body
- + Interrupted slot, slot width 30/50 mm
- + With cast honeycomb grating (500/287/30, MW 20/75 mm)
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint

Description	Length	Width at top/bottom	Construction height	Weight	Inlet cross section	Load class DIN EN 1433	Article No.
Channel	4000 mm	500/540 mm	520 mm	1995.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035230826

**Slot channel element** | without internal inbuilt fall | with horizontal outlet | Class D 400

- + Monolithic concrete body
- + 2-sided channel connection
- + With PEHD pipe support DA 225
- + PEHD pipe support DA 160 or DA 315 alternatively upon request
- + With cast honeycomb grating (500/287/30, MW 20/75 mm)
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint



Description	Length	Width at top/bottom	Construction height	Weight	Load class DIN EN 1433	Article No.
Channel	2000 mm	500/560 mm	770 mm	1495.0 kg	A 15 – D 400	035230531

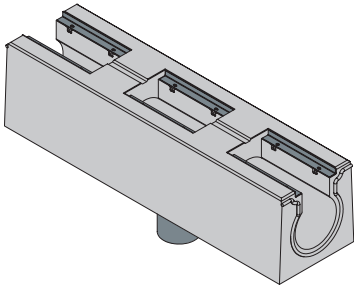
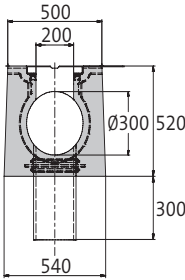
We reserve the right to make technical or other changes even without prior notification.  
 Class D 400 = Slot channels can be installed without a load-bearing foundation.  
 Class F 900 = Slot channels must be installed with a load-bearing foundation..  
 Special lengths and laying spades available upon request.



BIRCOsolid slot channels Pfuhrer System Z Type K DN 300

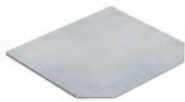
Slot channel element | without internal inbuilt fall | with horizontal outlet | Class F 900

- + Monolithic concrete body
- + 2-sided channel connection
- + With PEHD pipe support DA 225
- + PEHD pipe support DA 160 or DA 315 alternatively upon request
- + With cast honeycomb grating (500/287/30, MW 20/75 mm)
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint



Description	Length	Width at top/bottom	Construction height	Weight	Load class DIN EN 1433	Article No.
Channel	2000 mm	500/540 mm	520 mm	872.0 kg	A 15 – F 900	035230831

End caps



Description	Width	For construction height	Weight	Article No.
End cap for load class D 400, galvanised	500 mm	770 mm	5.3 kg	035230547
End cap for load class F 900, galvanised	500 mm	520 mm	5.3 kg	035230847

We reserve the right to make technical or other changes even without prior notification.  
Clas D 400 = Slot channels can be installed without a load-bearing foundation.  
Class F 900 = Slot channels must be installed with a load-bearing foundation..  
Special lengths and laying spades available upon request.



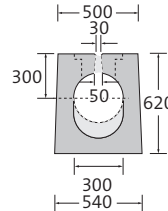
Capable of bearing maximum loads and resistant against aggressive agents.  
BIRCOsolid System Pfuhler at a freighting company operation.

# BIRCOsolid slot channels

## Pfuhler System Z – Type K Profile 300/400

**Slot channel elements** | with 0.5% internal inbuilt fall | Class F 900

- + Monolithic concrete body
- + Interrupted slot, slot width 30/50 mm
- + With cast honeycomb grating (500/287/30, MW 20/75 mm)
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint



Description	Length	Width at top/bottom	Construction height	Weight	Inlet cross section	Load class DIN EN 1433	Article No.
Channel No. 1	4000 mm	500/540 mm	620 mm	2200.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035234801
Channel No. 2	4000 mm	500/540 mm	620 mm	2255.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035234802
Channel No. 3	4000 mm	500/540 mm	620 mm	2315.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035234803
Channel No. 4	4000 mm	500/540 mm	620 mm	2375.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035234804
Channel No. 5	4000 mm	500/540 mm	620 mm	2435.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035234805

**Slot channel element** | without internal inbuilt fall | Class F 900

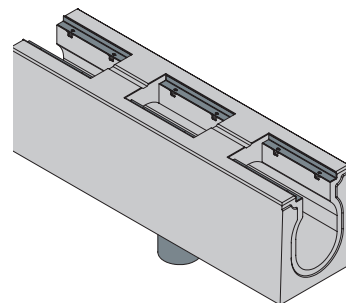
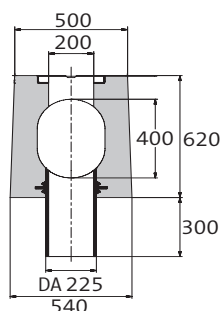
- + Monolithic concrete body
- + Interrupted slot, slot width 30/50 mm
- + With cast honeycomb grating (500/287/30, MW 20/75 mm)
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint

Description	Length	Width at top/bottom	Construction height	Weight	Inlet cross section	Load class DIN EN 1433	Article No.
Channel	4000 mm	500/540 mm	620 mm	2170.0 kg	239 cm <sup>2</sup> /m	A 15 – F 900	035234826

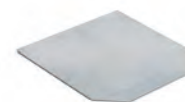
We reserve the right to make technical or other changes even without prior notification.  
 Class F 900 = Slot channels must be installed with a load-bearing foundation..  
 Special lengths and laying spades available upon request.

**Slot channel element** | without internal inbuilt fall | with horizontal outlet | Class F 900

- + Monolithic concrete body
- + 2-sided channel connection
- + With PEHD pipe support DA 225
- + PEHD pipe support DA 160 or DA 315 alternatively upon request
- + With cast honeycomb grating (500/287/30, MW 20/75 mm)
- + With hot-dipped galvanised solid steel angle for combi-closure system
- + Visible sealing joint



Description	Length	Width at top/bottom	Construction height	Weight	Load class DIN EN 1433	Article No.
Channel	2000 mm	500/540 mm	620 mm	1300.0 kg	A 15 – F 900	035234831

**End cap**


Description	Width	For construction height	Weight	Article No.
End cap, galvanised	500 mm	620 mm	6.4 kg	035234847

We reserve the right to make technical or other changes even without prior notification.  
 Class F 900 = Slot channels must be installed with a load-bearing foundation.  
 Special lengths and laying spades available upon request.

# BIRCOsolid slot channel | Pfuhler

## System Z – Installation Instructions

1. The regulations contained in the general WHG Certificate No. Z-74.4-46 of February 01st, 2012 that are relevant for conducting installation must be observed.
2. Depending upon the characteristics of the sub-stratum and the frequency of traffic over the traffic area, the reinforced concrete slot channels must be installed on a carefully sealed bed of gravel-sand or chippings (frost protection layer) as well as a sub-base course made of C 25/30 (Class D) concrete or a structurally calculated reinforced concrete foundation (Class F). The nominal values providing the basis for the structural calculation of the sub-grade underneath the foundation or the sub-base course and the minimum dimensions as well as the minimum reinforcement of the foundation are provided in the standard drawings regarding installation and bedding for the respective load class contained in the comprehensive laying instructions and must be complied with in their entirety.

With load class F, the upper facing of the foundation to be positioned underneath the channels must be contoured according to the stipulations of the standard drawing in accordance with DIN 1045-1 in such manner that toothed interlocking results. This contouring must be executed diagonally to the direction of the channel line. Alternatively, the granular structure of the concrete surface of the foundation can be exposed. The connection between the channel and the foundation must be made with a joint connected using a grouting mortar or an adhesive grouting mortar or swelling grout mortar that is approved by DIBt Berlin. The grout joint must correspond with at least the strength property of C 25/30 concrete. If the subsequent entry of moisture in this joint cannot be ruled out, then the frost-resistance or resistance to frost de-icing salt of the grouting material must be taken into consideration.

3. Reinforced concrete slot channels are to be laid with suitable hoisting equipment that ensures even, precise and delicate hoisting and lowering. The slot channel lifting equipment provided must always be used in this process.

In the case of class D 400, the slot channels are to be laid in the prepared grout bed and the height is to be aligned using wedges. It is not permitted to conduct all of the tamping afterwards due to the necessity of the bedding covering the entire area.

Class F 900 channels must be placed on appropriate spacers and aligned. The gap then emerging between the channel unit and the foundation must be filled with the grouting mortar indicated above in such manner that it is ensured that the bedding covers the entire surface of the channel.

Elastomer spacers are attached to the front face ensuring compliance with the end joint width. The channels must be positioned in such manner that the spacers on both components are touching. If no spacers are present, the correct end joint width can also be provided for by inserting wooden slats of the appropriate thickness into the joint during positioning, for example. If necessary, the alignment of the surfaces is to be conducted by laying wedges underneath.

No forces from the adjacent traffic areas, e.g., as a result of temperature stress for example, may be transmitted to the slot channels. If these are made of stiff materials such as concrete, then such considerations must be made in the planning. Therefore, expansion joints (no dummy joints) in the correct dimensions are to be provided in the plates along the length of the reinforced concrete slot channels. In order to enable the transfer of braking forces from the channels to the adjacent components, a continuous line of EPS hard foam panels EPS EN 13163 CS (I0) 150 with a maximum width of 8 cm or an equivalent is to be installed along the joint over the entire height of the channel between the channel units and the traffic area. These plates may not be so heavily compressed as a result of expansion of the adjacent surface pavements that they transfer horizontal forces from the surfaces to the channel units.

4. Once laying and finishing work of the adjacent areas has been completed, all of the longitudinal and diagonal joints are to be filled with a joint sealant officially approved by the presiding building authorities for storage, filling and transferring facilities for water-hazardous substances. The corresponding installation instructions and stipulations of the manufacturer of the sealing material must be complied with. An assembly and inspection opening is provided for this purpose on the end joints of the channels.
5. To avoid flaking on the borders and edges, reinforced concrete slot channels may not be driven over during the construction phase prior to completion of the adjacent traffic areas. When using sealing equipment or



road finishers, it must be ensured that they are not led too close to the reinforced concrete slot channels.

with no prior notice. Go to [www.rohr.de](http://www.rohr.de) for the latest comprehensive laying guidelines.

6. Prior to installation of the lateral traffic areas or back-filling, a leak test must be performed in the style of DIN EN 1610, 13.3 "Testing with water (procedure >W<). In a departure from the regulations therein, the channel units are to be filled with water at the lowest point up to the upper edge of the slots, and the water level must be kept constant throughout the duration of the test. For the amount of the maximum amount of water to be filled in, the values of DIN EN 1610, 13.3.4 are relevant.
7. The above laying instructions represent general instructions with no relation to the specific installation situation. Consequently, the additional requirements that can apply from local government, statics and other factors in a genuine installation situation must also be taken into account. Changes can be made at any time, also

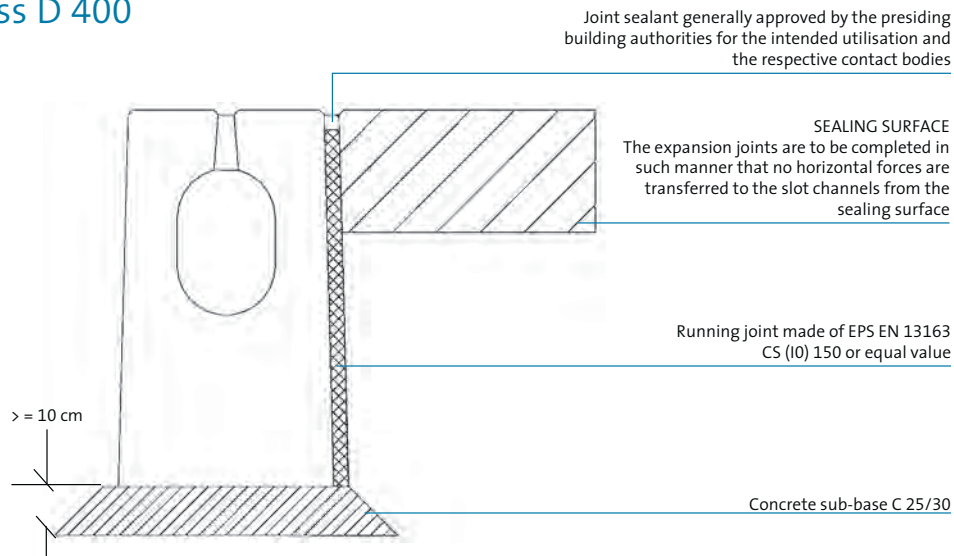
### Fast, safe installation | Efficient time and cost management

- + BIRCOsolid – Pfuhler System Z with 4 metre channel units makes it possible to conduct laying quickly using fewer joints.
- + The one-piece Type I channel unit does not require additional encasing. This reduces concrete casing work.

## Installation examples – BIRCOsolid slot channels – Pfuhler System Z – Type

For traffic areas with high wheel loads and for heavily frequented heavy-duty transport areas.

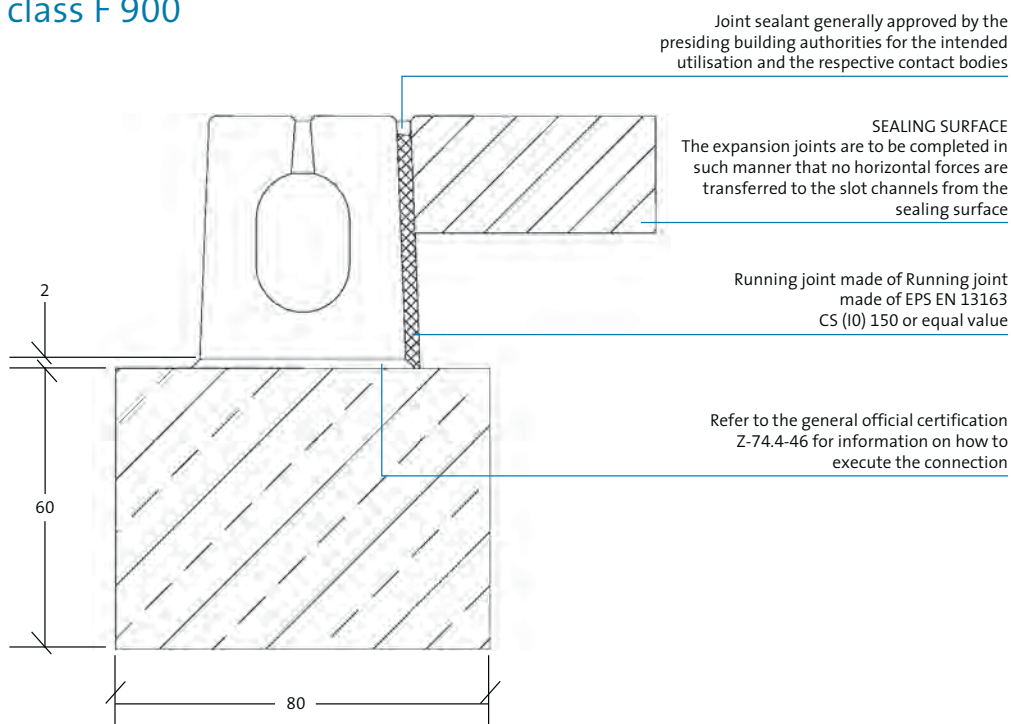
### Up to class D 400



The sub-base course foundation must be comprised of ground that is not sensitive to frost. Foundation soil stiffness coefficient  $E_s = 60.000 \text{ kN/m}^2$  and compaction values

of the foundation soil in accordance with ZTVE-StB or ZTVTStB corresponding to the construction class of the traffic area.

### Up to class F 900



The foundation surface must be contoured. The foundation must be based on ground that is not sensitive to frost. Foundation soil stiffness coefficient  $E_s = 60.000 \text{ kN/m}^2$  and foundation soil compaction values in accordance with ZTVE-StB or ZTVT-StB corresponding to “Hinweise für

den Bau von Betondecken auf Flugplätzen” (‘Instructions for the Construction of Concrete Pavements at Airfields’), FGSV (‘The Association for the Research of Road and Traffic Matters’).

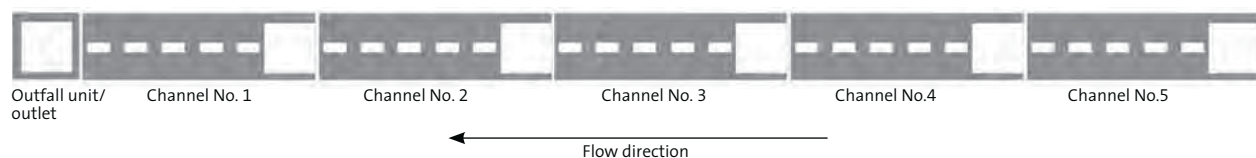
# Laying example

## Channels with and without inbuilt falls

Laying arrangement.

BIRCOsolid slot channels – Pfuhler System Z –Type K,  
channels with inspection opening

Channel line with or without integrated gradient with outfall unit at the end.

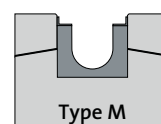


### Distinction between 2 types

- + **Type I:** Requires no load-bearing foundation and/or no full concrete surround: for example BIRCOsolid grid channel.
- + **Type M:** Requires a load-bearing foundation and/or encasing: for example BIRCOprotect.



Type I



Type M

## BIRCOsolid slot channels – Pfuhler System Z drainage performance

BIRCO channel systems provide outstanding drainage performance. BIRCO offers a calculation service in addition to this diagram.

### BIRCOsolid slot channel – Pfuhler System Z – Type K

#### DN 300 | Class D 400 and F 900

	Drainage capacity at the channel end	Cross-sectional area at the channel end
without inbuilt fall	39.22 l/sec	706.00 cm <sup>2</sup>
No. 1	41.53 l/sec	706.00 cm <sup>2</sup>
No. 2	40.35 l/sec	686.00 cm <sup>2</sup>
No. 3	38.24 l/sec	650.00 cm <sup>2</sup>
No. 4	35.65 l/sec	606.00 cm <sup>2</sup>
No. 5	32.65 l/sec	555.00 cm <sup>2</sup>

With planned tailback

#### Profile 300/400 | class F 900

	Drainage capacity at the channel end	Cross-sectional area at the channel end
without inbuilt fall	55.89 l/sec	1006.00 cm <sup>2</sup>
No. 1	59.18 l/sec	1006.00 cm <sup>2</sup>
No. 2	55.71 l/sec	947.00 cm <sup>2</sup>
No. 3	52.18 l/sec	887.00 cm <sup>2</sup>
No. 4	48.65 l/sec	827.00 cm <sup>2</sup>
No. 5	45.12 l/sec	767.00 cm <sup>2</sup>

With planned tailback

These diagrams can only provide the desired result in a few cases since the job definition is influenced in large part by the conditions on-site, i.e., the location of the existing drains, the number of drainage lines, etc. Therefore we recommend a hydraulic calculation from our personnel with a proposed design.

## BIRCO and the Neu-Ulm concrete manufacturing factory bundle core skills

Drainage specialist BIRCO is responsible for the sales in Germany and the countries it borders of “Pfuhler slot channels – System Z” manufactured by Betonwerk Neu-Ulm (‘Neu-Ulm concrete factory’) for the drainage of facilities for the storage, filling and transfer of water-hazardous substances. In turn, the BIRCOsolid slot channels designed for the same area of application are produced at the Neu-Ulm facility.

Both manufacturers are market leaders in the surface pavement drainage segment, and with this cooperation they bundle their skills in the production, development and sale of slot channels for facilities conducting the storage, filling and transfer of water-hazardous substances. This provides an extensive range of officially certified reinforced concrete slot channels in a variety of profiles for a broad range of applications. The areas of application include petrol station and rest stop facilities, parking lots, industrial and port facilities, container terminals and aircraft operation areas.



The concrete factory in Neu-Ulm has for years been one of the leading manufacturers of slot channels and other concrete and reinforced concrete products for supply and disposal. The cooperation agreement for officially certified slot channels was officially sealed in August of 2006 by BIRCO owner Frank Wagner (BIRCO) and Betonwerk Neu-Ulm owner Michael Goebel.

The product range that the cooperation encompasses includes two variations of officially certified channel drainage systems for utilisation in facilities for the storage, filling and transfer of water-hazardous substances, also for use of the channel storage volume as storage space in the event of accidents.





[illegible]

- + Chemical plants
- + Petrol stations, extinguishing water collection points
- + Facilities for the storage, filling and transferring of water-hazardous substances (WHG areas) with the stress stages “Low”, “Medium” and “High”
- + Industrial construction, acid-protection construction
- + Production areas, transport hubs

## BIRCOdicht | Facts

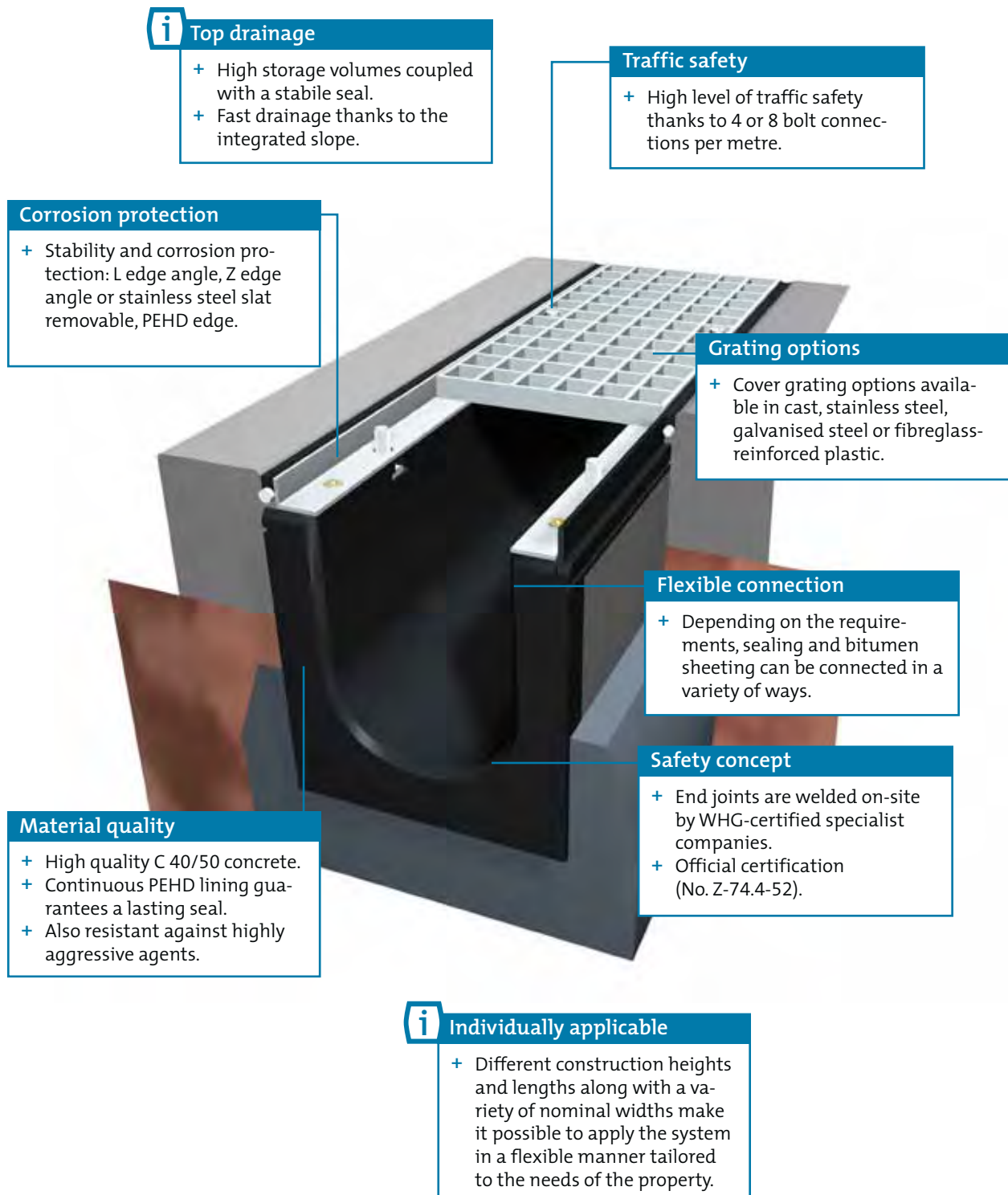
- + Channel system: NW 150 to 300 mm (NW 400 upon request) with and without in-built falls
- + Official certification (No. Z-74.4-52)
- + Construction lengths up to 2.0 metres, various construction heights
- + Load class: A 15 – F 900
- + Outfall units in any nominal width and shut-off outfall units to NW 300
- + Broad range of covers, also including fibreglass-reinforced covers



# BIRCOdicht |

## The channel safety system

BIRCOdicht guarantees high storage volumes and fast drainage combined with lasting resistance to highly aggressive agents.





## Distel-Brauerei Distelhausen – Reliable drainage

The Distelbrauerei brewery in Distelhausen has its own company petrol station. The subsequent close proximity between the foodstuffs processing industry and petrol and oil necessitates a particularly sensitive drainage solution. The BIRCOdicht system here features a continuous PEHD lining and two sump wells, ensuring the reliable, safe drainage of all substances hazardous to water.



## Bayer Wolfenbüttel – Safe railroad track drainage



Bayer is one of the biggest names in the pharmaceutical research and manufacturing industry. Bayer relies on BIRCO's expertise for WHG-compliant planning of its drainage systems, including its rail track drainage systems.

## Evonik Niederkassel – Chemical resistance for the chemicals industry

Evonik is active in a variety of special chemicals segments and is one of the world's leading companies in this sector. Drainage solutions for this sector demand systems that are absolutely reliable in their long-term resistance against aggressive agents. BIRCO installed a WHG-compliant BIRCOdicht channel system at Evonik.



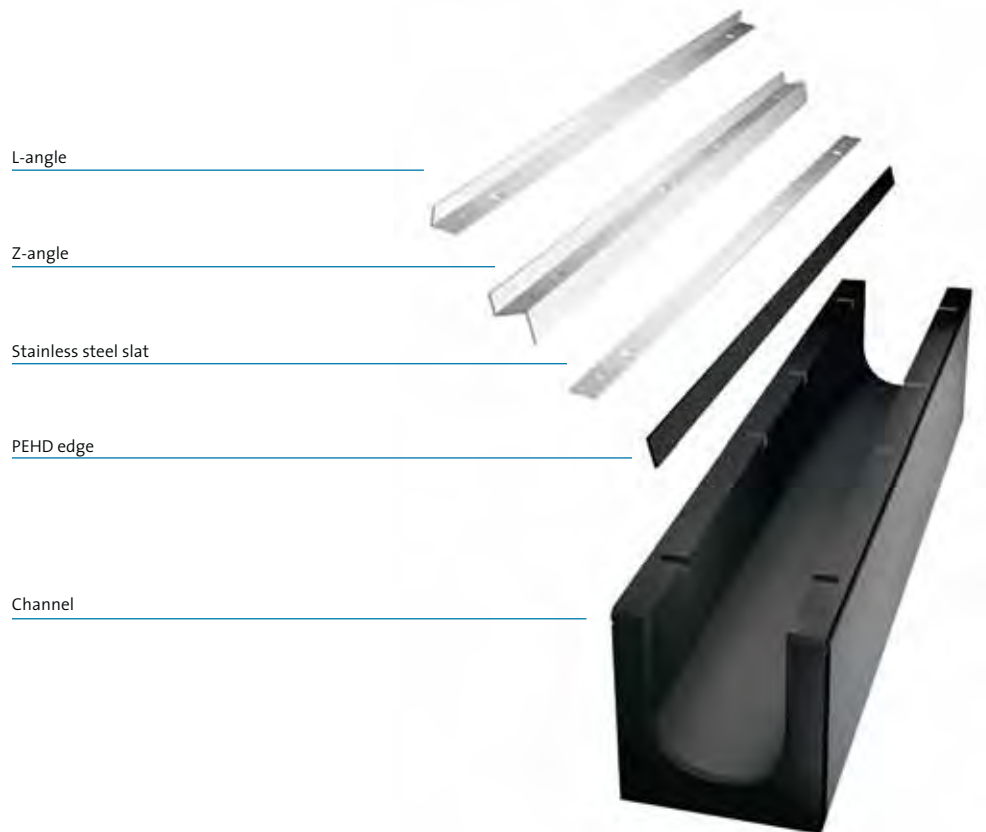
### BIRCOdicht | Explosion-protected areas

- + At facilities for the storage, filling and transfer of water-hazardous substances in explosion-protected areas, PE linings, edge angles and covers must be made of electrically conductive materials.
- + PEHD slats form the connection here to the adjacent surface pavement area or the permanently elastic sealing joint.

# BIRCOdicht |

## The channel safety system

BIRCOdicht system components



## Removable angles

The variety of combinations guarantees a secure connection solution to the adjacent surface pavement. Depending on the individual application situation, angles can be selected that are made of either fibreglass-reinforced plastic, steel or stainless steel. The seal tightness between

the pavement and the channel is achieved either by joining along the channel with BIRCO-Plast or the welding of a sealing sheet to the channel slat during construction. Depending on the model, a channel system load of up to Class F 900 is achieved.

## Uplift guard / Bolting

A uplift guard prevents the channel from being able to be dislocated from the base course. At the same time it aids in the laying process. The V2A bolt connection on the cover consists of a stud bolt with special lock nuts. To counteract cold soldering, the stud bolts are treated with a copper conductor paste at the factory. Please observe the turning and torque moments here (also refer to the Installation Instructions).





## Geometry variations

BIRCO also offers corner and T-pieces in the nominal widths 150, 200 and 300 (nominal width 400 upon request) as standard solutions; also with different structures.



Corner unit



T-unit

## BIRCOdicht in the rail sector

BIRCOdicht was also designed as a special option for railroad facilities. It features integrated slots for the rail line.

The slots are integrated into the channel units in accordance with the track gauges, providing an ideal solution for the crossing or traversing of the line drainage and eliminating the necessity of additional processing work. The corresponding track profiles are fed through the slots and expertly sealed. This enables the delineation of the operating area in the vicinity of the rails to be completed throughout. Matching covers are supplied and bolted in a manner that ensures traffic safety.



Slots in the channel unit for the rail crossing



BIRCOdicht in the rail sector

# BIRCOdicht |

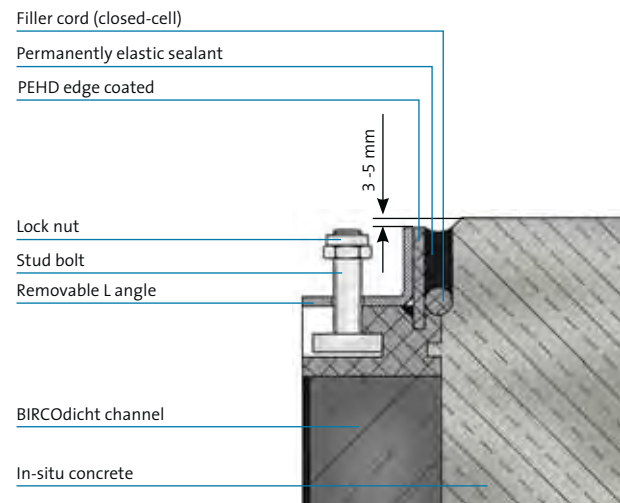
## The channel safety system

The BIRCOdicht options with installation examples.

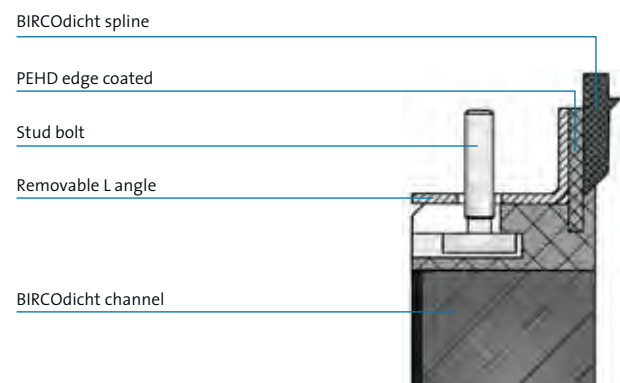
### BIRCOdicht |

- + BIRCOdicht with L angle (hot galvanized, stainless steel V2A/V4A or GRP), PEHD edge coated on L angles and pockets for M12 securing of the grating.
- + WHG certification.

### Installation with WHG certification: PEHD edge coated on the L angle



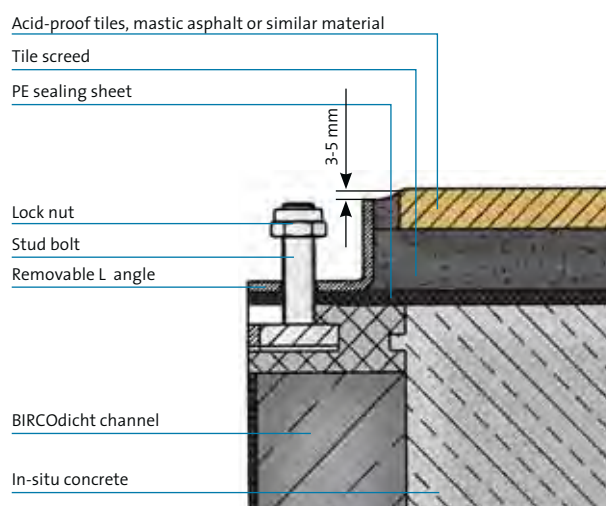
### Installation preparation: PEHD edge coated with spline



## BIRCOdicht |

- + BIRCOdicht with L angles (hot galvanised, stainless steel V2A/ V4A or GRP) and pockets for M 12 securing of the grating.

Alternative installation (permissible in individual cases): PE sealing sheet or stainless steel coated bitumen sheet clamped between channel and edge angle

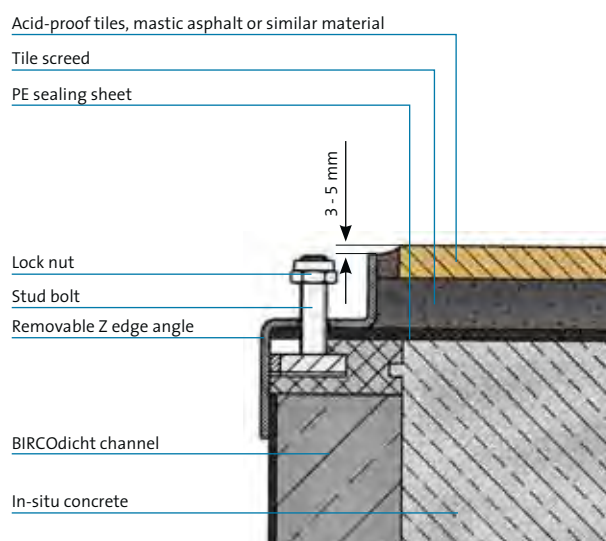


Alternatively, the PE sealing sheet can also be welded to the PEHD slat during construction.

## BIRCOdicht |

- + BIRCOdicht with Z angles (hot galvanised, stainless steel V2A/V4A or GRP) and pockets for for M 12 securing of the grating.

Alternative installation (permissible in individual cases): PE sealing sheet clamped between the channel and edge angle



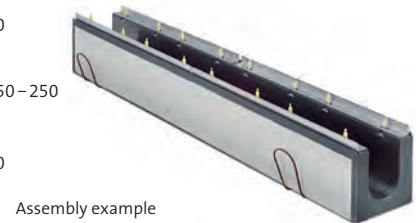
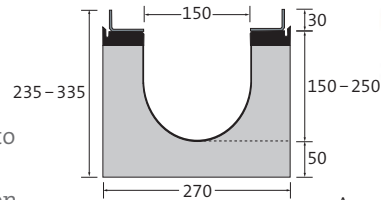
Alternatively, the PE sealing sheet can also be welded to the PEHD slat during construction.

# BIRCOdicht | NW 150

Highest level of resistance against highly aggressive agents

## Channel elements | 0.5% internal inbuilt fall

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + Special widths, special lengths or PP lining possible upon request
- + Upon request, channels are also possible up to No. 29/30 and with special gradient
- + Assembly section connection on the side upon request



Description	Length	Width	Construction height at groove/tongue with angle	Weight	Load class DIN EN 1433	Article No. without angle
Channel No. 1/2	2000 mm	270 mm	235/245 mm	129.0 kg	A 15 – F 900	048185
Channel No. 3/4	2000 mm	270 mm	245/255 mm	132.6 kg	A 15 – F 900	048186
Channel No. 5/6	2000 mm	270 mm	255/265 mm	136.4 kg	A 15 – F 900	048187
Channel No. 7/8	2000 mm	270 mm	265/275 mm	140.1 kg	A 15 – F 900	048188
Channel No. 9/10	2000 mm	270 mm	275/285 mm	143.8 kg	A 15 – F 900	048189
Channel No. 11/12	2000 mm	270 mm	285/295 mm	147.6 kg	A 15 – F 900	048190
Channel No. 13/14	2000 mm	270 mm	295/305 mm	151.3 kg	A 15 – F 900	048191
Channel No. 15/16	2000 mm	270 mm	305/315 mm	155.0 kg	A 15 – F 900	048192
Channel No. 17/18	2000 mm	270 mm	315/325 mm	158.8 kg	A 15 – F 900	048193
Channel No. 19/20	2000 mm	270 mm	325/335 mm	162.5 kg	A 15 – F 900	048194

## Channel elements | without internal inbuilt fall

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + Special widths, special lengths or PP lining possible upon request

Description	Length	Width	Construction height at groove/tongue with angle	Weight	Load class DIN EN 1433	Article No. without angle
Channel No. 0/0	2000 mm	270 mm	235/235 mm	129.0 kg	A 15 – F 900	048134
Channel No. 10/0	2000 mm	270 mm	285/285 mm	144.0 kg	A 15 – F 900	048136
Channel No. 20/0	2000 mm	270 mm	335/335 mm	162.5 kg	A 15 – F 900	048138



## BIRCOdicht | PEHD

- + PEHD (Polyethylene High Density) is permanently resistant against numerous aggressive agents. In addition, PEHD's exceptional durability can compensate for changes in the ground such as settlement without leakages occurring in the channel line.

With PP linings, all accessory parts are also made of PP.  
Angles and slats must be ordered separately.

Exception up to D 400: Not for use across the carriage- way of highways or motorways.

**Corner pieces 90° | without internal inbuilt fall**

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + PP lining possible upon request
- + Construction height and shank length can be adapted to the conditions on-site
- + Intermediate height to No. 30/0 is possible



Description	Length	Width	Construction height with angle	Weight	Load class DIN EN 1433	Article No. without angle
Corner piece No. 0/0	755 mm	515 mm	235 mm	92.0 kg	A 15 – F 900	048150
Corner piece No. 10/0	755 mm	515 mm	285 mm	103.0 kg	A 15 – F 900	048151
Corner piece No. 20/0	755 mm	515 mm	335 mm	114.0 kg	A 15 – F 900	048152

**T-pieces 90° | without internal inbuilt fall**

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + PP lining possible upon request
- + Construction height and shank length can be adapted to the conditions on-site
- + Intermediate height to No. 30/0 is possible



Description	Length	Width	Construction height with angle	Weight	Load class DIN EN 1433	Article No. without angle
T-piece No. 0/0	1500 mm	770 mm	235 mm	142.0 kg	A 15 – F 900	048160
T-piece No. 10/0	1500 mm	770 mm	285 mm	161.0 kg	A 15 – F 900	048161
T-piece No. 20/0	1500 mm	770 mm	335 mm	180.0 kg	A 15 – F 900	048162

**L-angles | removable**

- + Thickness 4 mm
- + Assembled ex-factory
- + Can be combined with PEHD edges
- + Z angles, stainless steel slats, assembly section connections and rust-proofing upon request



Description	Length	Width	Height	Weight	Article No.
hot-dipped galvanised	980 mm	48 mm	34 mm	4.5 kg	048110
stainless steel (V2A)	980 mm	48 mm	34 mm	4.5 kg	048111

With PP linings, all accessory parts are also made of PP.  
 Angles and slats must be ordered separately.  
 Exception up to D 400: Not for use across the carriage- way of highways or motorways.



### End caps and drainage sockets

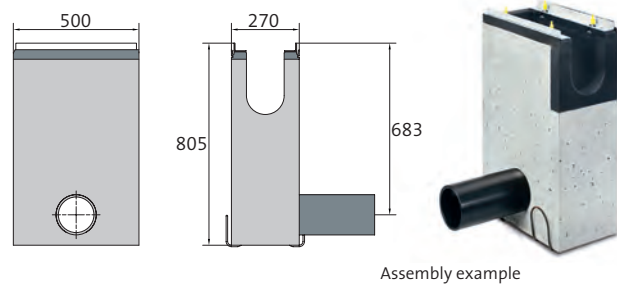
- + Welded ex-factory
- + Drainage sockets welded vertically or horizontally (ground level)



Description	Drain length	Width	For construction height	Weight	Article No.
End cap, PEHD, No. 0/0 – 10	–	270 mm	235 – 285 mm	1.4 kg	048140
End cap, PEHD, No. 11 – 20/0	–	270 mm	285 – 335 mm	2.0 kg	048141
End cap with outlet DA 160-SDR 17, PEHD, No. 0/0 – 10	300 mm	270 mm	235 – 285 mm	2.7 kg	048145
End cap with outlet DA 160-SDR 17, PEHD, No. 11 – 20/0	300 mm	270 mm	285 – 335 mm	3.3 kg	048146
Drainage socket DA 110-SDR 17, PEHD	300 mm	–	235 – 285 mm	1.2 kg	608150
Drainage socket DA 160-SDR 17, PEHD	300 mm	–	285 – 335 mm	3.3 kg	608151

### In-line outfall unit | 1-piece

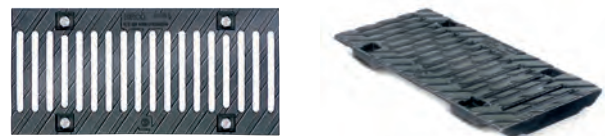
- + 1- or 2-sided channel connection
- + PEHD lining, PEHD edge coated
- + Pipe socket DA 160-SDR 17 (length 300 mm)
- + Different drains available according to the customer's wishes
- + Changes in the construction height and the drain direction and diameter are possible
- + Structural variations in accordance with customer wishes
- + With integrated PEHD silt bucket upon request
- + PP lining possible upon request



Description	Length	Width	Construction height with angle	Weight	Load class DIN EN 1433	Article No. without angle
In-line outfall unit	500 mm	270 mm	805 mm	111.0 kg	A 15 – F 900	049105

### Slotted cast gratings

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection
- + Including bolt connection nuts



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	237 mm	30 mm	8.6 kg	SW 150/12 mm	644 cm <sup>2</sup> /m	A 15 – C 250	180172
black	500 mm	237 mm	30 mm	10.5 kg	SW 150/12 mm	644 cm <sup>2</sup> /m	A 15 – E 600	180175
galvanised	500 mm	237 mm	30 mm	10.0 kg	SW 150/12 mm	644 cm <sup>2</sup> /m	A 15 – E 600	180175v
black	500 mm	237 mm	30 mm	12.2 kg	SW 150/12 mm	644 cm <sup>2</sup> /m	A 15 – F 900	180178

With PP linings, all accessory parts are also made of PP.

Angles and slats must be ordered separately.

SW = slot width, article no. with v = galvanised

Exception up to D 400: Not for use across the carriage- way of highways or motorways.

**Mesh gratings | cast**

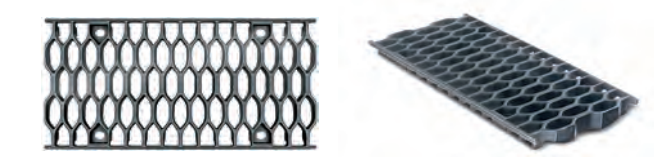
- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection
- + Including bolt connection nuts



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	237 mm	30 mm	11.0 kg	MW 20/30 mm	1110 cm <sup>2</sup> /m	A 15 – E 600	180186
galvanised	500 mm	237 mm	30 mm	11.0 kg	MW 20/30 mm	1110 cm <sup>2</sup> /m	A 15 – E 600	180186v

**Honeycomb gratings | cast**

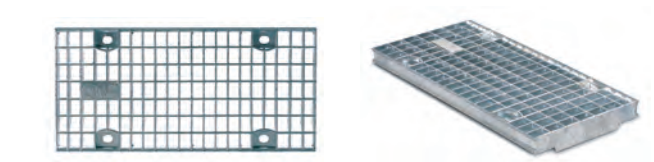
- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection
- + Including bolt connection nuts



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	237 mm	30 mm	7.6 kg	MW 24/59 mm	1396 cm <sup>2</sup> /m	A 15 – E 600	180179
galvanised	500 mm	237 mm	30 mm	7.6 kg	MW 24/59 mm	1396 cm <sup>2</sup> /m	A 15 – E 600	180179v

**Mesh gratings**

- + Hot-dipped galvanised
- + Including 4-point M12/A2 per grating bolt connection
- + Including bolt connection nuts
- + On request also available in stainless steel



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
hot-dipped galvanised	500 mm	237 mm	30 mm	3.6 kg	MW 30/30 mm	1285 cm <sup>2</sup> /m	A 15 – C 250	180162
hot-dipped galvanised	1000 mm	237 mm	30 mm	7.0 kg	MW 30/30 mm	1285 cm <sup>2</sup> /m	A 15 – C 250	180152
hot-dipped galvanised	500 mm	237 mm	30 mm	4.2 kg	MW 30/15 mm	1185 cm <sup>2</sup> /m	A 15 – C 250	180163
hot-dipped galvanised	1000 mm	237 mm	30 mm	8.1 kg	MW 30/15 mm	1185 cm <sup>2</sup> /m	A 15 – C 250	180153
hot-dipped galvanised	500 mm	237 mm	30 mm	7.4 kg	MW 20/30 mm	1088 cm <sup>2</sup> /m	A 15 – E 600	180164
hot-dipped galvanised	1000 mm	237 mm	30 mm	14.5 kg	MW 20/30 mm	1088 cm <sup>2</sup> /m	A 15 – E 600	180154

With PP linings, all accessory parts are also made of PP.

Angles and slats must be ordered separately.

MW = mesh width, article no. with v = galvanised

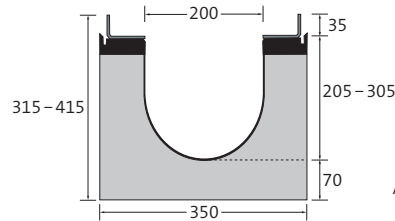
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

# BIRCOdicht | NW 200

Highest level of resistance against highly aggressive agents

## Channel elements | 0.5% internal inbuilt fall

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + Special widths, special lengths or PP lining possible upon request
- + Upon request, channels are also possible up to No. 29/30 and with special gradient



Description	Length	Width	Construction height at groove/tongue with angle	Weight	Load class DIN EN 1433	Article No. without angle
Channel No. 1/2	2000 mm	350 mm	315/325 mm	232.5 kg	A 15 – F 900	048285
Channel No. 3/4	2000 mm	350 mm	325/335 mm	239.8 kg	A 15 – F 900	048286
Channel No. 5/6	2000 mm	350 mm	335/345 mm	247.2 kg	A 15 – F 900	048287
Channel No. 7/8	2000 mm	350 mm	345/355 mm	254.5 kg	A 15 – F 900	048288
Channel No. 9/10	2000 mm	350 mm	355/365 mm	260.8 kg	A 15 – F 900	048289
Channel No. 11/12	2000 mm	350 mm	365/375 mm	268.5 kg	A 15 – F 900	048290
Channel No. 13/14	2000 mm	350 mm	375/385 mm	275.4 kg	A 15 – F 900	048291
Channel No. 15/16	2000 mm	350 mm	385/395 mm	281.7 kg	A 15 – F 900	048292
Channel No. 17/18	2000 mm	350 mm	395/405 mm	289.1 kg	A 15 – F 900	048293
Channel No. 19/20	2000 mm	350 mm	405/415 mm	296.4 kg	A 15 – F 900	048294

## Channel elements | without internal inbuilt fall

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + Special widths, special lengths or PP lining possible upon request

Description	Length	Width	Construction height at groove/tongue with angle	Weight	Load class DIN EN 1433	Article No. without angle
Channel No. 0/0	2000 mm	350 mm	315/315 mm	233.2 kg	A 15 – F 900	048234
Channel No. 10/0	2000 mm	350 mm	365/365 mm	260.8 kg	A 15 – F 900	048236
Channel No. 20/0	2000 mm	350 mm	415/415 mm	289.4 kg	A 15 – F 900	048238

With PP linings, all accessory parts are also made of PP.  
Angles and slats must be ordered separately.

Exception up to D 400: Not for use across the carriage-way of highways or motorways.

**Corner pieces 90° | without internal inbuilt fall**

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + PP lining possible upon request
- + Construction height and shank length can be adapted to the conditions on-site
- + Intermediate height to No. 30/0 is possible



Description	Length	Width	Construction height with angle	Weight	Load class DIN EN 1433	Article No. without angle
Corner piece No. 0/0	835 mm	515 mm	315 mm	155.0 kg	A 15 – F 900	048250
Corner piece No. 10/0	835 mm	515 mm	365 mm	170.0 kg	A 15 – F 900	048251
Corner piece No. 20/0	835 mm	515 mm	415 mm	185.0 kg	A 15 – F 900	048252

**T-pieces 90° | without internal inbuilt fall**

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + PP lining possible upon request
- + Construction height and shank length can be adapted to the conditions on-site
- + Intermediate height to No. 30/0 is possible



Description	Length	Width	Construction height with angle	Weight	Load class DIN EN 1433	Article No. without angle
T-piece No. 0/0	1500 mm	850 mm	315 mm	235.0 kg	A 15 – F 900	048260
T-piece No. 10/0	1500 mm	850 mm	365 mm	266.0 kg	A 15 – F 900	048261
T-piece No. 20/0	1500 mm	850 mm	415 mm	297.0 kg	A 15 – F 900	048262

**L-angles | removable**

- + Thickness 4 mm
- + Assembled ex-factory
- + Can be combined with PEHD edges
- + Z angles, stainless steel slats, assembly section connections and rust-proofing upon request



Description	Length	Width	Height	Weight	Article No.
hot-dipped galvanised	980 mm	64 mm	39 mm	5.8 kg	048210
stainless steel (V2A)	980 mm	64 mm	39 mm	5.8 kg	048211

With PP linings, all accessory parts are also made of PP.  
Angles and slats must be ordered separately.  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.



### End caps and drainage sockets

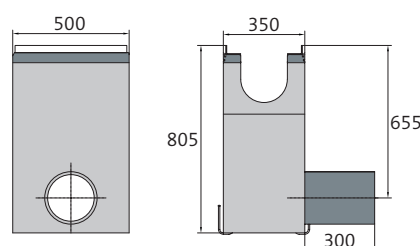
- + Welded ex-factory
- + Drainage sockets welded vertically or horizontally (ground level)



Description	Drain length	Width	For construction height	Weight	Article No.
End cap, PEHD, No. 0/0 – 10	–	350 mm	315 – 365 mm	2.5 kg	048240
End cap, PEHD, No. 11 – 20/0	–	350 mm	365 – 415 mm	3.3 kg	048241
End cap with outlet DA 225-SDR 17, PEHD, No. 0/0 – 10	300 mm	350 mm	315 – 365 mm	5.1 kg	048245
End cap with outlet DA 225-SDR 17, PEHD, No. 11 – 20/0	300 mm	350 mm	365 – 415 mm	5.8 kg	048246
Drainage socket DA 160-SDR 17, PEHD	300 mm	–	315 – 415 mm	3.3 kg	608151

### In-line outfall unit | 1-piece

- + 1- or 2-sided channel connection
- + PEHD lining, PEHD edge coated
- + Pipe socket DA 225-SDR 17 (length 300 mm)
- + Different drains available according to the customer's wishes
- + Changes in the construction height and the drain direction and diameter are possible
- + Structural variations in accordance with customer wishes
- + With integrated PEHD silt bucket upon request
- + PP lining possible upon request



Assembly example

Description	Length	Width	Construction height with angle	Weight	Load class DIN EN 1433	Article No. without angle
In-line outfall unit	500 mm	350 mm	805 mm	154.0 kg	A 15 – F 900	049205



### BIRCOdicht | PEHD

- + PEHD (Polyethylene High Density) is permanently resistant against numerous aggressive agents. In addition, PEHD's exceptional durability can compensate for changes in the ground such as settlement without leakages occurring in the channel line.

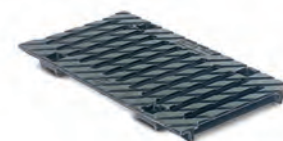
With PP linings, all accessory parts are also made of PP.  
Angles and slats must be ordered separately.

Exception up to D 400: Not for use across the carriage- way of highways or motorways.



### Slotted cast gratings

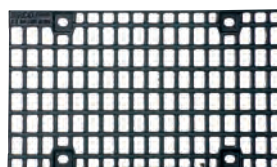
- + Black immersion-lacquered
- + 8 point per metre M12/A2 bolt connection
- + Including bolt connection nuts



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	317 mm	35 mm	17.1 kg	SW 200/18 mm	802 cm <sup>2</sup> /m	A 15 – F 900	180278

### Mesh gratings | cast

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection
- + Including bolt connection nuts



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	317 mm	35 mm	15.6 kg	MW 20/30 mm	1549 cm <sup>2</sup> /m	A 15 – E 600	180286
galvanised	500 mm	317 mm	35 mm	15.6 kg	MW 20/30 mm	1549 cm <sup>2</sup> /m	A 15 – E 600	180286v

With PP linings, all accessory parts are also made of PP.

Angles and slats must be ordered separately.

SW = slot width, MW = mesh width, article no. with v = galvanised

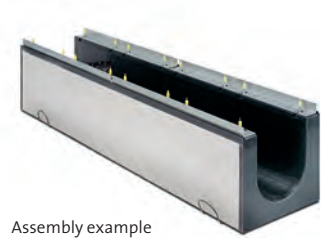
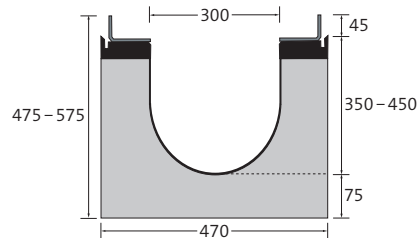
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

# BIRCOdicht | NW 300

Highest level of resistance against highly aggressive agents

## Channel elements | 0.5% internal inbuilt fall

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + Special widths, special lengths or PP lining possible upon request
- + Upon request, channels are also possible up to No. 29/30 and with special gradient



Description	Length	Width	Construction height at groove/tongue with angle	Weight	Load class DIN EN 1433	Article No. without angle
Channel No. 1/2	2000 mm	470 mm	475/485 mm	381.2 kg	A 15 – F 900	048385
Channel No. 3/4	2000 mm	470 mm	485/495 mm	388.6 kg	A 15 – F 900	048386
Channel No. 5/6	2000 mm	470 mm	495/505 mm	397.0 kg	A 15 – F 900	048387
Channel No. 7/8	2000 mm	470 mm	505/515 mm	404.4 kg	A 15 – F 900	048388
Channel No. 9/10	2000 mm	470 mm	515/525 mm	412.7 kg	A 15 – F 900	048389
Channel No. 11/12	2000 mm	470 mm	525/535 mm	421.1 kg	A 15 – F 900	048390
Channel No. 13/14	2000 mm	470 mm	535/545 mm	428.5 kg	A 15 – F 900	048391
Channel No. 15/16	2000 mm	470 mm	545/555 mm	436.9 kg	A 15 – F 900	048392
Channel No. 17/18	2000 mm	470 mm	555/565 mm	444.3 kg	A 15 – F 900	048393
Channel No. 19/20	2000 mm	470 mm	565/575 mm	452.6 kg	A 15 – F 900	048394

## Channel elements | without internal inbuilt fall

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + Special widths, special lengths or PP lining possible upon request

Description	Length	Width	Construction height at groove/tongue with angle	Weight	Load class DIN EN 1433	Article No. without angle
Channel No. 0/0	2000 mm	470 mm	475/475 mm	380.9 kg	A 15 – F 900	048334
Channel No. 10/0	2000 mm	470 mm	525/525 mm	412.7 kg	A 15 – F 900	048336
Channel No. 20/0	2000 mm	470 mm	575/575 mm	444.6 kg	A 15 – F 900	048338

With PP linings, all accessory parts are also made of PP.  
Angles and slats must be ordered separately.

Exception up to D 400: Not for use across the carriage-way of highways or motorways.

**Corner pieces 90° | without internal inbuilt fall**

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + PP lining possible upon request
- + Construction height and shank length can be adapted to the conditions on-site
- + Intermediate height to No. 30/0 is possible



Description	Length	Width	Construction height with angle	Weight	Load class DIN EN 1433	Article No. without angle
Corner piece No. 0/0	955 mm	515 mm	475 mm	195.0 kg	A 15 – F 900	048350
Corner piece No. 10/0	955 mm	515 mm	525 mm	219.0 kg	A 15 – F 900	048351
Corner piece No. 20/0	955 mm	515 mm	575 mm	243.0 kg	A 15 – F 900	048352

**T-pieces 90° | without internal inbuilt fall**

- + Structural variations in accordance with customer wishes
- + PEHD lining, PEHD edge coated
- + PP lining possible upon request
- + Construction height and shank length can be adapted to the conditions on-site
- + Intermediate height to No. 30/0 is possible



Description	Length	Width	Construction height with angle	Weight	Load class DIN EN 1433	Article No. without angle
T-piece No. 0/0	1500 mm	970 mm	475 mm	375.0 kg	A 15 – F 900	048360
T-piece No. 10/0	1500 mm	970 mm	525 mm	410.0 kg	A 15 – F 900	048361
T-piece No. 20/0	1500 mm	970 mm	575 mm	445.0 kg	A 15 – F 900	048362

**L-angles | removable**

- + Thickness 4 mm
- + Assembled ex-factory
- + Can be combined with PEHD edges
- + Z angles, stainless steel slats, assembly section connections and rust-proofing upon request



Description	Length	Width	Height	Weight	Article No.
hot-dipped galvanised	980 mm	73 mm	49 mm	6.8 kg	048310
stainless steel (V2A)	980 mm	73 mm	49 mm	6.8 kg	048311

With PP linings, all accessory parts are also made of PP.

Angles and slats must be ordered separately.

Exception up to D 400: Not for use across the carriage- way of highways or motorways.

### End caps and drainage sockets

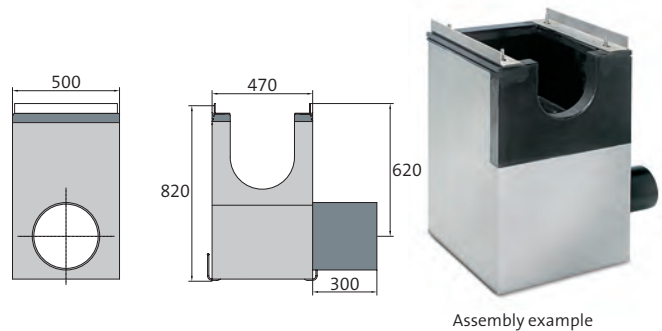
- + Welded ex-factory
- + Drainage sockets welded vertically or horizontally (ground level)



Description	Drain length	Width	For construction height	Weight	Article No.
End cap, PEHD, No. 0/0 – 10	–	470 mm	475 – 525 mm	2.5 kg	048340
End cap, PEHD, No. 11 – 20/0	–	470 mm	525 – 575 mm	3.3 kg	048341
End cap with outlet DA 315-SDR 17, PEHD, No. 0/0 – 10	300 mm	470 mm	475 – 525 mm	5.1 kg	048345
End cap with outlet DA 315-SDR 17, PEHD, No. 11 – 20/0	300 mm	470 mm	525 – 575 mm	5.8 kg	048346
Drainage socket DA 315-SDR 17, PEHD	300 mm	–	475 – 575 mm	3.3 kg	608250

### In-line outfall unit | 1-piece

- + 1- or 2-sided channel connection
- + PEHD lining, PEHD edge coated
- + Pipe socket DA 315-SDR 17 (length 300 mm)
- + Different drains available according to the customer's wishes
- + Changes in the construction height and the drain direction and diameter are possible
- + Structural variations in accordance with customer wishes
- + With integrated PEHD silt bucket upon request
- + PP lining possible upon request



Assembly example

Description	Length	Width	Construction height with angle	Weight	Load class DIN EN 1433	Article No. without angle
In-line outfall unit	500 mm	470 mm	820 mm	214.2 kg	A 15 – F 900	049305



### BIRCOdicht | PEHD

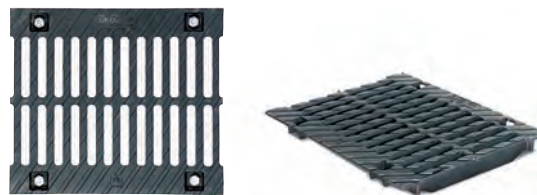
- + PEHD (Polyethylene High Density) is permanently resistant against numerous aggressive agents. In addition, PEHD's exceptional durability can compensate for changes in the ground such as settlement without leakages occurring in the channel line.

With PP linings, all accessory parts are also made of PP.  
Angles and slats must be ordered separately.

Exception up to D 400: Not for use across the carriage-way of highways or motorways.

**Slotted cast gratings | two-fold**

- + Black immersion-lacquered or galvanised
- + 8 point per metre M12/A2 bolt connection
- + Including bolt connection nuts



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	437 mm	45 mm	35.1 kg	SW 142/20 mm	1491 cm <sup>2</sup> /m	A 15 – F 900	180378

With PP linings, all accessory parts are also made of PP.  
 Angles and slats must be ordered separately.  
 SW = slot width, MW = mesh width, article no. with v = galvanised  
 Exception up to D 400: Not for use across the carriage- way of highways or motorways.

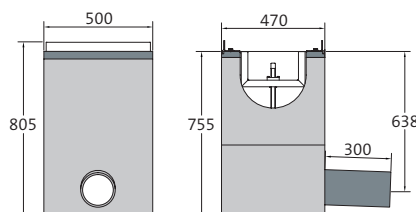


# BIRCOdicht | NW 150 – 300

Highest level of resistance against highly aggressive agents

## In-line outfall unit with shut-off device | 1-piece

- + 1- or 2-sided channel connection (in the middle)
- + Manually operated valve flape DN 150
- + PEHD lining, PEHD edge coated
- + Pipe socket DA 160 - SDR 17 (length 300 mm)
- + Drain direction in accordance with the customer's wishes
- + Different drains available according to the customer's wishes
- + Changes to outfall unit heights possible
- + Structural variations in accordance with customer wishes
- + PP lining possible upon request



Description	Length	Width	Construction height with angle	Weight	Load class DIN EN 1433	Article No.
Shut-off outfall unit	500 mm	470 mm	805 mm	253.7 kg	A 15 – F 900	049309

## Slotted cast gratings | two-fold | with key bushing | for in-line outfall unit with shut-off device

- + With key bushing
- + Black immersion-lacquered or galvanised
- + Including 4-point M12/A2 per grating bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	437 mm	45 mm	32.4 kg	SW 125/20 mm	746 cm <sup>2</sup> /m	A 15 – F 900	049311

## Service key

- + For in-line outfall unit with shut-off device
- + For manual operation



Description	Weight	Article No.
Service key	3.4 kg	044303

With PP linings, all accessory parts are also made of PP.  
Angles and slats must be ordered separately.  
SW = slot width, MW = mesh width, article no. with v = galvanised  
Exception up to D 400: Not for use across the carriage- way of highways or motorways.



BIRCOdicht special solution with concrete surround and hit-dipped galvanised surface protection.



# BIRCOdicht point drainage | A safety system that gets to the point

BIRCOdicht point drainage guarantees the safe collection and retention even of highly aggressive agents. Applicable as shut-off gullies, point drainage and sump wells or in combination with BIRCOdicht line drainage.

+ A 15 to E 600



E 600

+ WHG Certificate  
No. Z-74.4-52



WHG



For the collection and retention of aggressive agents. Applicable as point drainage and for connection to a line drainage system.

## BIRCOdicht point drainage | Areas of application

- + Chemical plants
- + Petrol stations, extinguishing water collection points
- + Facilities for the storage, filling and transferring of water-hazardous substances (WHG areas) with the stress stages “Low”, “Medium” and “High”
- + Industrial construction, acid-protection construction
- + Production areas, transport hubs

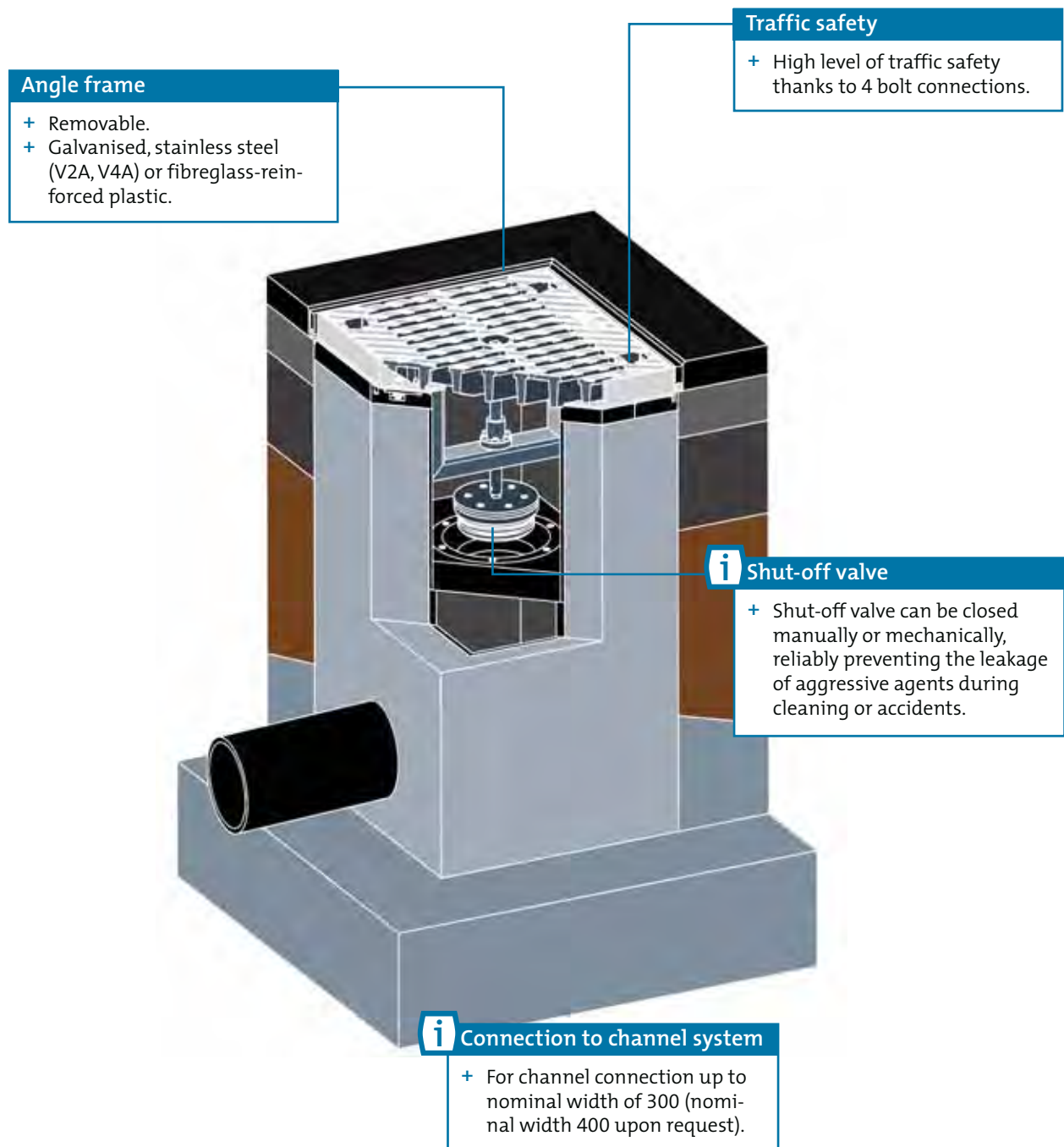
**BIRCOdicht point drainage** | Facts

- + Shut-off outfall units or point drainage
- + Official certification (No. Z-74.4-52)
- + Sump well (without WHG certification)
- + With solid steel angle (removable)
- + Channel connection up to nominal width 300
- + Load class: A 15 – E 600
- + Gratings with 4 bolt connections (dip-coated in black, galvanised, stainless steel, fibreglass-reinforced plastic)



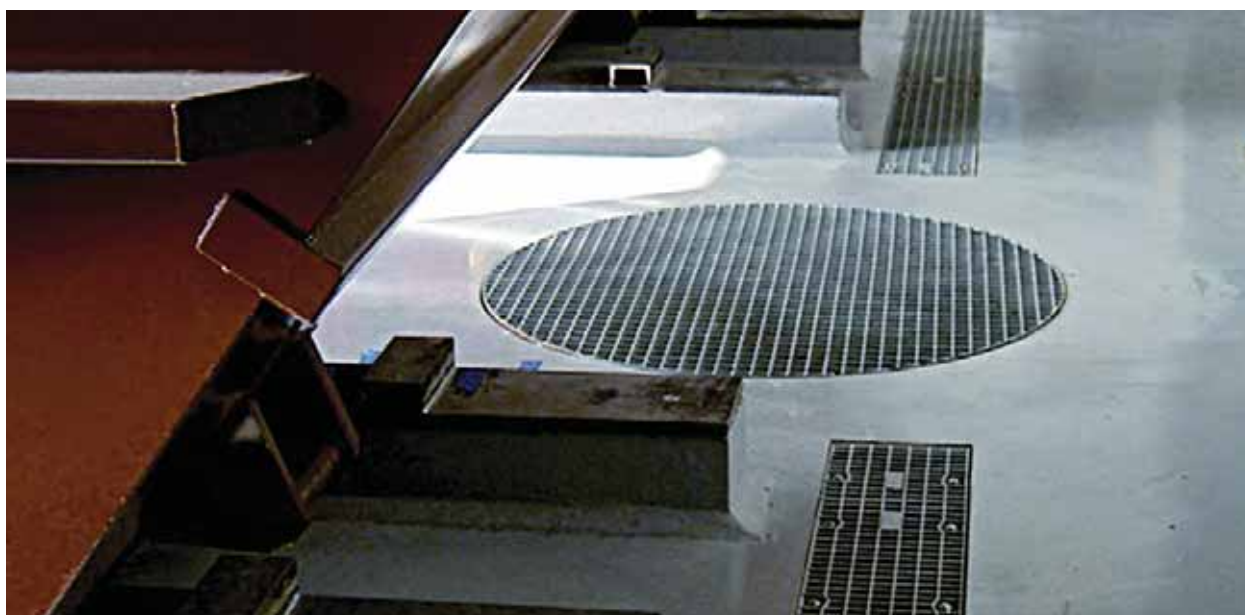
# BIRCOdicht point drainage | A safety system that gets to the point

BIRCOdicht point drainage collects and retains aggressive agents.

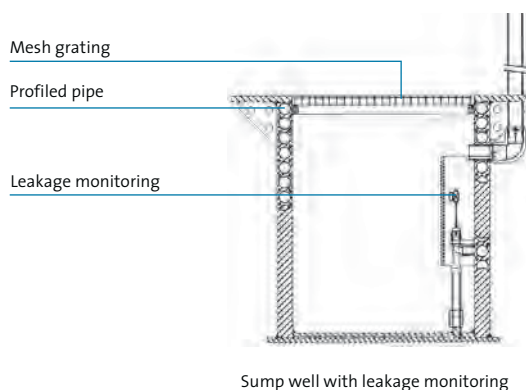




## Zeiss Oberkochen – Leakage monitoring

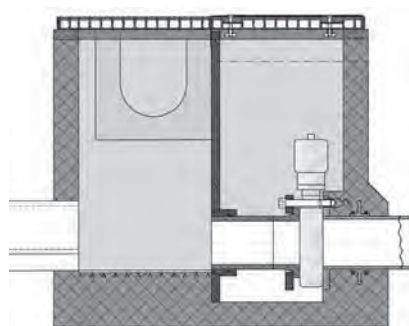


At the world-famous Carl Zeiss AG operation in Oberkochen, the manufacturing process produces sludge containing drill cuttings mixed with oily cooling lubricant. BIRCO sump wells with leakage monitoring and a two-sided connection to a BIRCOdicht channel system with an integrated slope were installed for the collection of these waste materials. Sump wells with leakage monitoring are available with internal diameters of 600 – 1600 mm and up to a height of 1500 mm. Other dimensions are possible specifically tailored to the property in question. Sump wells can be produced optionally with feed and drainage sockets.



## Maschinenfabrik Regensburg – With shut-off equipment

BIRCO's mechanically closed shut-off gullies are additionally augmented by BIRCO outfall units that close automatically. Closure is conducted by a pneumatic or electrical motor. At a machinery factory in Regensburg, the BIRCOdicht sump well was fitted with a chamber that separates the motor area from the area containing liquid agents. BIRCOdicht NW 200 drainage panels were connected and a DA 160 PEHD pipe was chosen as the drain line. This enabled BIRCO to offer a complete system solution in the form of a sump well with a fully automated closing feature for the shut-off device.



Automatically closing sump well

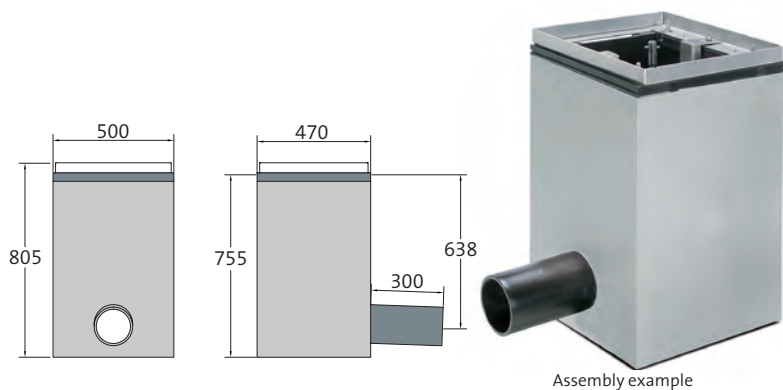
# BIRCOdicht point drainage

## WHG-certified point drainage of aggressive agents

Base shut-off outfall unit as point feed inlet

1-piece

- + Without channel connection
- + With manual shut-off valve DN 150
- + PEHD lining, PEHD edge coated
- + Pipe sockets DA 160-SDR 17 (Length 300 mm)
- + Drainage direction according to the customer's wishes
- + Other drains according to the customer's wishes
- + Changes in the outfall unit height are possible
- + Including stainless steel L angle frames (V2A - also removable)
- + Structural variations upon request
- + Also possible with PP lining upon request



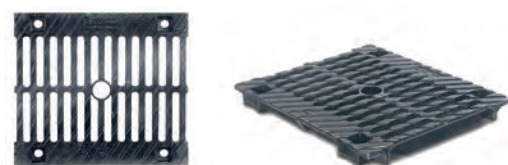
Description	Length	Width	Construction height with frame	Weight	Load class DIN EN 1433	Article No.
Shut-off outfall unit	500 mm	470 mm	805 mm	265.7 kg	A 15 – E 600	049319

Slotted cast grating

two-fold

for shut-off outfall unit

- + With key bushing
- + Black immersion-lacquered or galvanised
- + Including 4-point M12/A2 per grating bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	500 mm	437 mm	45 mm	32.4 kg	SW 142/20 mm	746 cm²/m	A 15 – E 600	049311

Service key

- + For in-line outfall unit with shut-off device
- + For manual operation

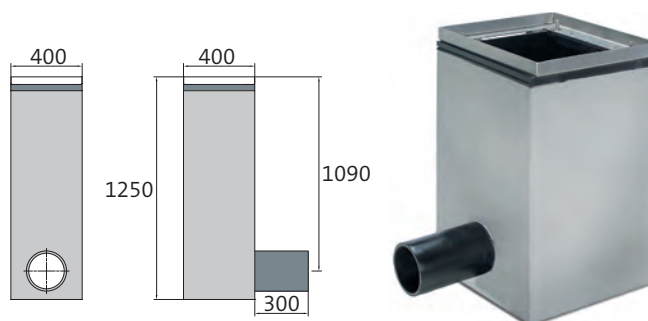


Description	Weight	Article No.
Service key	3.4 kg	044303

With PP linings, all accessory parts are also made of PP.  
 Angles, edges and slats must be ordered separately.  
 SW = slot width,  
 Exception up to D 400: Not for use across the carriage- way of highways or motorways.

**Outfall unit 40/40 | 1-piece**

- + Without channel connection (channel connection up to NW 200 according to the customer's wishes)
- + Stainless steel frame (V2A, removable)
- + Pipe socket DA 225 - SDR 17 (Length 300 mm), other pipe sockets upon request
- + Can also be used without a drain as a sump well
- + PEHD-lining, PEHD edge coated
- + Other height possible upon request
- + Also possible with PP lining upon request
- + Not WHG-certified



Description	Length	Width	Construction height with frame	Weight	Load class DIN EN 1433	Article No.
Outfall unit 40/40	400 mm	400 mm	1250 mm	223.4 kg	A 15 – E 600	080400

**Slotted cast grating | two-fold | for outfall unit 40/40**

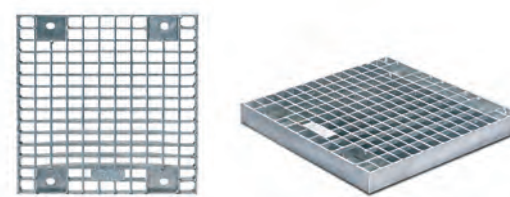
- + Black immersion-lacquered
- + Including 4-point M12/A2 per grating bolt connection



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
black	380 mm	380 mm	40 mm	20.5 kg	SW 133/15 mm	389 cm <sup>2</sup> /m	A 15 – E 600	180815

**Mesh gratings | for outfall unit 40/40**

- + Hot-dipped galvanised
- + Including 4-point M12/A2 per grating bolt connection
- + On request also available in stainless steel (V2A)



Description	Length	Width	Height	Weight	Inlet opening	Inlet cross section	Load class DIN EN 1433	Article No.
hot-dipped galvanised	380 mm	380 mm	40 mm	10.2 kg	MW 20/30 mm	931 cm <sup>2</sup> /m	A 15 – E 600	180818
hot-dipped galvanised	380 mm	380 mm	40 mm	11.2 kg	MW 20/12 mm	828 cm <sup>2</sup> /m	A 15 – E 600	180819

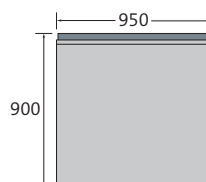
With PP linings, all accessory parts are also made of PP.  
Angles, edges and slats must be ordered separately.  
SW = slot width

Exception up to D 400: Not for use across the carriage-way of highways or motorways.

## BIRCOdicht point drainage

**Sump well** | 1-piece

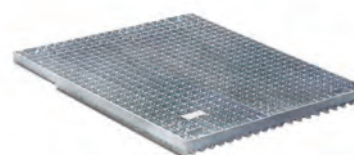
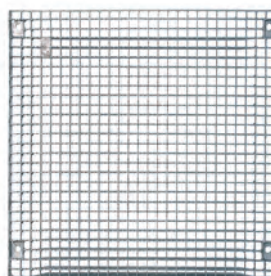
- + PEHD-lining, PEHD edge coated
- + Stainless steel frame (V2A)
- + Channel connections possible for every nominal width
- + Other height possible upon request
- + Double-walled sump well upon request
- + PP lining upon request
- + Also available as a sump well that can be monitored upon request
- + Not WHG-certified



Description	Length	Width	Construction height with frame	Weight	Load class DIN EN 1433	Article No.
Sump well	950 mm	950 mm	900 mm	712.0 kg	A 15 – E 600	080401

**Mesh grating** | for sump well

- + 2-piece
- + Hot dipped galvanised
- + Including 4-point M12/A2 per grating bolt connection
- + On request also available in stainless steel (V2A or V4A))



Description	Length	Width	Height	Weight	Inlet opening	Load class DIN EN 1433	Article No.
hot-dipped galvanised	916 mm	916 mm	35 mm	121.0 kg	MW 30/30 mm	A 15 – C 250	080452

With PP linings, all accessory parts are also made of PP.  
MW = mesh width

Exception up to D 400: Not for use across the carriage-way of highways or motorways.





BIRCO sump well with leakage monitoring and two-sided channel connection to BIRCOdicht.



# BIRCOdicht | Installation Instructions

A number of details must be observed when installing BIRCOdicht. For a comprehensive description please read [here](#).

To guarantee smooth operation, the following general valid installation instructions must be observed:

1. Prior to installation, the correct load class in accordance with DIN EN 1433 must be selected.
2. Thanks to the high level of stability, laying the BIRCOdicht channels is conducted on an earth-moist C 25/30 strip of foundation concrete at least 20 cm high which must be tapered in a conical shape on both sides. No encasing or reinforcement on the sides is generally required. Begin laying the channel line following the outfall with the highest channel at the drain and form the channel line with the next-smallest number.
3. All adjoining pavement surfaces should **permanently run approximately 3 - 5 mm higher than the upper edge of the channel**. Because there is no concrete encasing, the surface pavement can run right up to the channel without any problems.
4. For installation in concrete surfaces or reinforced concrete constructions, running joints must be provided on both sides to compensate horizontal forces that emerge. These joints should be planned at an interval of some 0.2 to 0.5 metres from the channel. Joints running diagonally to the channel line in the adjacent concrete surfaces (in-situ concrete) must be arranged so that they run through a channel end.
5. Proceed analogously when installing the outfall unit.

6. Local particularities can require special installation methods that have to be examined and taken into account by the planner(s). The installation must comply with the latest regulations and guidelines such as ZTVT, ZTV concrete, ZTV bit and RStO.

The following particularities must also be observed:

- + **Moving the channels and PE welding of the channel ends and connection lines must be conducted by an authorised specialist company in accordance with Regulation on facilities for handling water-hazardous substances §3..**
- + The PEHD lining must be protected from mechanical damages and open flame.
- + The BIRCOdicht channels may only be positioned or transported with the assistance of the moving equipment designed for this purpose (bloating guard).
- + Requirements regarding verification and maintenance must be fulfilled in accordance with the official building authority approval (see Page 131).



## General maintenance instructions

- + The nuts of the stud bolts must be inspected on a regular basis.
- + The movable/mechanical components of the shut-off gully must be inspected on a regular basis in regard to functionality.
- + Following an accident, the system components must be thoroughly cleaned and examined regarding their suitability for further use.

## Installation instructions in accordance with DIBt certification

**Installation instructions for traffic areas where substances accrue that are hazardous to water.  
Fuel depots | Extinguishing water collection points | Chemical companies | Storage, filling  
and transferring facilities for water-hazardous substances**

### General information

1. The installation of BIRCOdicht may in Germany only be conducted by companies that specialise in such activities in accordance with regulation on facilities for handling water-hazardous substances §3. These companies, including their personnel, must have been trained to do such work by an authorised institution. Special national requirements must be verified locally.
2. BIRCO has prepared installation and processing instructions for the correct installation of BIRCOdicht.
3. The installation requirements stipulated in the general DIBt certification or the installation requirements provided by BIRCO must be complied with.
4. The pre-fabricated parts are to be used together with the channels covers. System components may not be exchanged. Installation is to be conducted in accordance with the BIRCO installation and processing instructions.
5. The company conducting the installation work must supply the operator of the facility with a copy of the general DIBt or applicable water legislation authority certification.
6. The welding work (hot gas welding by extrusion of filler material) is to be conducted in accordance with DVS 2227-1.
7. Joints between the pre-fabricated parts and the adjoining sealing surfaces are to be jointed with the joint sealing system:
  - + “MASTERFLEX 700 WW gun grade”
  - + “MASTERFLEX 700 FR gun grade”
  - + or another system certified for this purpose by an official building authority verification of applicability that takes the official construction and water-related legal requirements into account. The joint sealant system that is used must additionally be certified by an official building authority verification of applicability that takes the official construction and water-related legal requirements into account.

### Inspection of the execution of the work

1. The structure of the concrete encasing in accordance with BIRCO's stipulations must be examined in regard to the local legal requirements and supplemented if necessary.
2. Sufficient sealing of the substratum is to be verified prior to laying the pre-fabricated parts.
3. Inspection of the welding seams and official logging of such seam inspection is to be conducted in accordance with DVS 2227-1.
4. Inspection of the execution of the joint sealing system is to be conducted in accordance with the requirements of the respective general building authority certification of the joint sealing system.
5. When laying pre-fabricated parts, drawings verifying the correct assembly are to be prepared by the construction supervisor or his/her representative.
6. These drawings must be present at the building site during construction and must be presented to the construction supervisory authorities upon demand. The drawings and the delivery notes must be kept and maintained by the company for a minimum of 5 years following completion of the work.

### Installation

1. The pre-fabricated parts must be fitted with all fixtures and connection equipment. Individual parts may not be exchanged.
2. Prior to laying the pre-fabricated parts, the suitability of the substratum in accordance with the applicable provisions must be established.
3. The pre-fabricated parts must be laid flush onto the concrete base layer.
4. Damaged pre-fabricated parts may not be used.
5. The installation of BIRCOdicht may only be conducted by companies that specialise in such activities in accordance with regulation on facilities for handling water-hazardous substances §3.). These companies, including their personnel, must have been trained to do such work by an authorised institution. Welding of the pre-fabricated parts at the construction site may only be conducted by persons possessing a valid certificate verifying that they have passed the official plastics welding examination in accordance with DVS 2212-1.

Continued on the next page



## Conditions for usage, servicing, maintenance

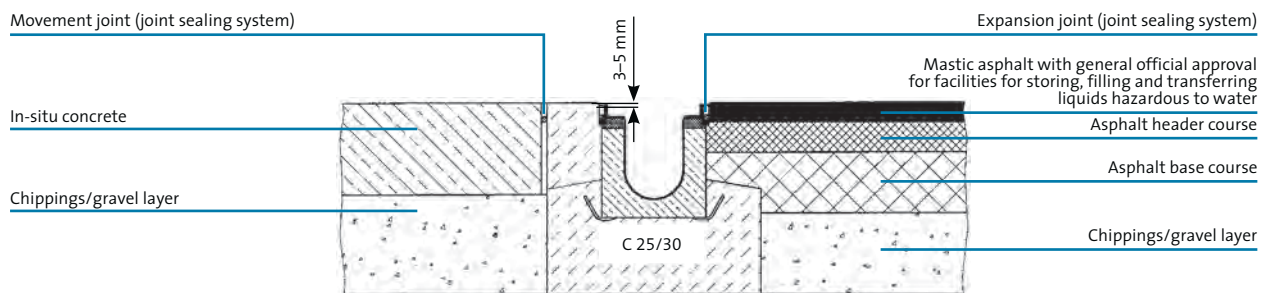
- Express reference is made here to the necessity for the constant monitoring by the operator of a facility for storing, filling and transferring liquids hazardous to water of the seal or functionality of the pre-fabricated parts in accordance with Regulation on facilities for handling water-hazardous substances §1.
- Larger quantities of drops accruing during filling or the transfer of liquids hazardous to water must be removed immediately. BIRCOdicht must be cleaned of soiling or the accumulation of mixtures of impurities and liquids that are hazardous to water. Cleaning of BIRCOdicht also includes cleaning of the outfalls and/or silt bucket.
- It must be ensured that in the event of damages, leaked liquids are removed as quickly as possible according to the following stipulations in accordance with TRwS "Ausführung von Dichtflächen" ("Execution of Sealed Surfaces"): in applications corresponding with the stress stage "High" such liquids must be removed within 8 hours; in applications with the stress stage "Medium" such liquids must be removed within 72 hours; in applications with the stress stage "Low" such liquids must be removed within 3 months.
- The operator of the facility is obligated to appoint only such companies to conduct maintenance, repair and cleaning of the pre-fabricated parts as are specialist businesses as defined by regulation on facilities for handling water-hazardous substances §3 and which are referred for such work by the manufacturer, unless the required work is exempted from this obligation in accordance with applicable state legislative provisions.
- The operator of the facility must arrange to have inspections conducted by water legislation experts in accordance with applicable state legislative provisions (start-up inspection, regular inspections).

## BIRCOdicht – Installation examples

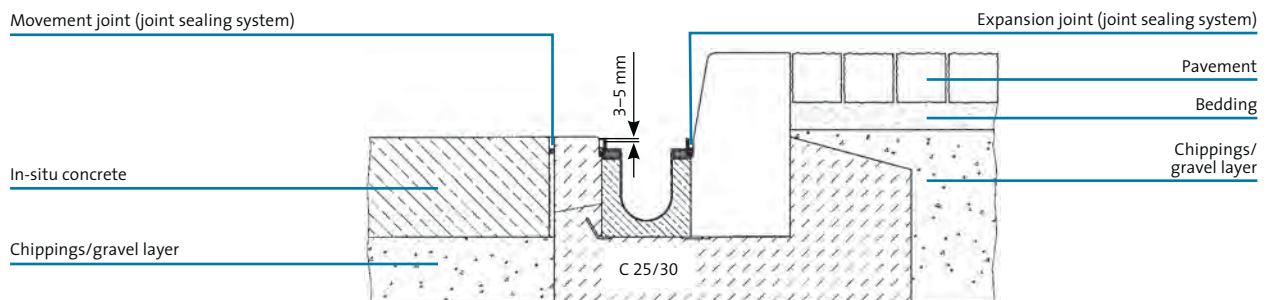
Installation instructions for traffic areas subjected to heavy wheel loads.

Petrol stations | Acid-protection construction | Filling facilities

### Class A 15 to E 600, Type M, NW 150 – 300



### Class A 15 to E 600, Type M, NW 150 – 300

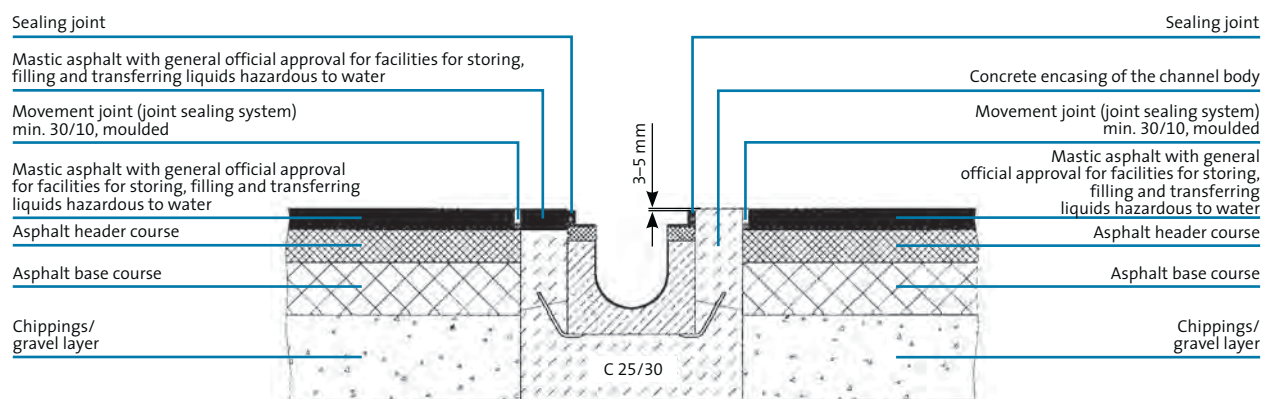


All installation examples are composed on the basis of non-settling, frost-proof substrata in accordance with the German Pavement Design Guidelines (RStO). For the installation dimensions see Page 134  
Exception starting with D 400: not for installation diagonally to the road for motorways and expressways

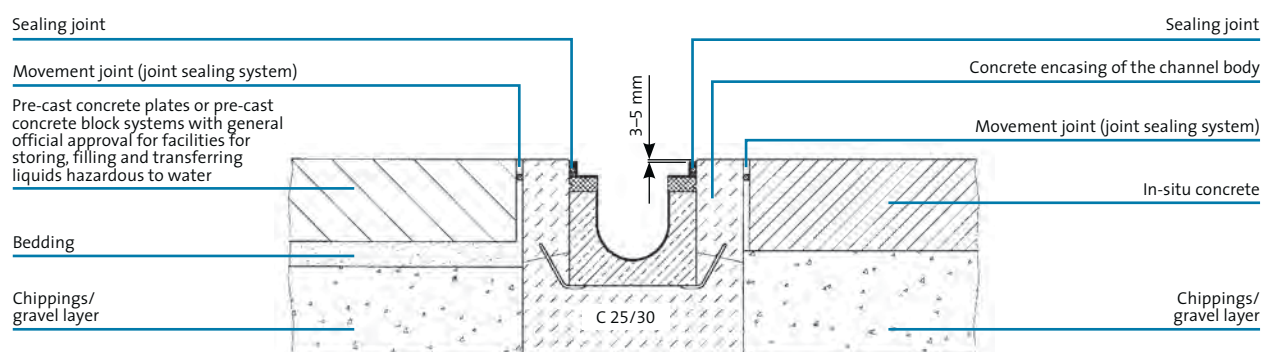
## BIRCOdicht – Installation examples

Expanded installation instructions for heavy-duty transport areas with frequent traffic.  
Logistics centres | Transport hubs | Vehicle manoeuvring | Aircraft pavements

### Class D 400 to F 900, Type M, NW 150 – 300



### Class D 400 to F 900, Type M, NW 150 – 300



The channels may not be exposed to any thermal or mechanical loads from the adjacent surface pavements.

The dimensions of the concrete surround must be adapted to the circumstances on-site and must consist of at least 15 cm. If no bond can be created between the base and the concrete surround, then dowel bars or flotation controls made of  $\varnothing 8$  mm reinforced bars are to be installed every 30 cm. The concrete qualities indicated are minimum values. Requirements related to the installation location according to DIN 1045-2 or DIN EN 206-1 regarding for instance resistance to frost and de-icing salt are to be taken into account in the choice of the concrete.

#### Bolting instructions:

Torque moments for screwing on the gratings are to be set at M12 = 60 Nm, M16 = 100 Nm. **The bolts on the gratings must be retightened at regular intervals.**

The BIRCOdicht base channels may only be positioned or transported with the assistance of the moving equipment designed for this purpose (bloating guard).

All installation examples are composed on the basis of non-settling, frost-proof substrata in accordance with the German Pavement Design Guidelines (RStO). For the installation dimensions see Page 134  
Exception starting with D 400: not for installation diagonally to the road for motorways and expressways

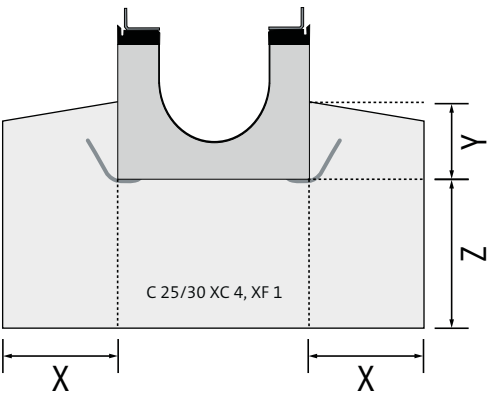
# BIRCOdicht overview

The manufacturer’s installation instructions must be followed in order to comply with the requirements stipulated by DIN EN 1433. The requirements according to the official certification by DIBt apply in regard to installation, verification and maintenance.

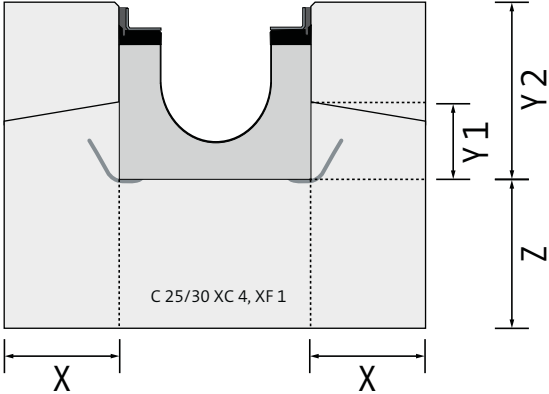
## BIRCOdicht

Nominal width	Type	Load class	X	Y/Y 1	Y 2	Z	Page
BIRCOdicht 150	M	A 15 – E 600	≥ 150	≥ 100	–	≥ 200	132
BIRCOdicht 150	M	D 400 – F 900	≥ 150	≥ 100	Construction height + 5 mm	≥ 200	133
BIRCOdicht 200	M	A 15 – E 600	≥ 150	≥ 100	–	≥ 200	132
BIRCOdicht 200	M	D 400 – F 900	≥ 150	≥ 100	Construction height + 5 mm	≥ 200	133
BIRCOdicht 300	M	A 15 – E 600	≥ 200	≥ 200	–	≥ 200	132
BIRCOdicht 300	M	D 400 – F 900	≥ 200	≥ 200	Construction height + 5 mm	≥ 200	133

## Schematic structure



Installation without concrete encasing on the sides



Installation with concrete encasing on the sides



## BIRCOdicht – drainage performance

BIRCO channel systems provide outstanding drainage performance. BIRCO offers a calculation service in addition to this diagram.

**BIRCOdicht NW 150 | 0.5 % inbuilt fall**

CL = 1000 mm	Drainage performance at the channel end	Cross-section area at the channel end	Storage volume
No. 0/0	11.17 l/sec*	201.0 cm <sup>2</sup>	20.1 l/sec*
No. 1/2	12.73 l/sec*	216.0 cm <sup>2</sup>	21.2 l/sec*
No. 3/4	13.61 l/sec*	231.0 cm <sup>2</sup>	22.7 l/sec*
No. 5/6	14.50 l/sec*	246.0 cm <sup>2</sup>	24.2 l/sec*
No. 7/8	15.38 l/sec*	261.0 cm <sup>2</sup>	25.7 l/sec*
No. 9/10	16.26 l/sec*	276.0 cm <sup>2</sup>	27.2 l/sec*
No. 10/0	15.33 l/sec*	276.0 cm <sup>2</sup>	27.6 l/sec*
No. 11/12	17.10 l/sec*	291.0 cm <sup>2</sup>	28.4 l/sec*
No. 13/14	18.00 l/sec*	306.0 cm <sup>2</sup>	29.9 l/sec*
No. 15/16	18.90 l/sec*	321.0 cm <sup>2</sup>	31.4 l/sec*
No. 17/18	19.80 l/sec*	336.0 cm <sup>2</sup>	32.9 l/sec*
No. 19/20	20.70 l/sec*	351.0 cm <sup>2</sup>	34.4 l/sec*
No. 20/0	19.50 l/sec*	351.0 cm <sup>2</sup>	35.1 l/sec*

\*Safety factor  $\nu = 1,2$

**BIRCOdicht NW 200 | 0.5 % inbuilt fall**

BL = 1000 mm	Drainage performance at the channel end	Cross-section area at the channel end	Storage volume
No. 0/0	20.39 l/sec*	367.0 cm <sup>2</sup>	36.7 l/sec*
No. 1/2	22.76 l/sec*	387.0 cm <sup>2</sup>	38.2 l/sec*
No. 3/4	23.93 l/sec*	407.0 cm <sup>2</sup>	40.2 l/sec*
No. 5/6	25.11 l/sec*	427.0 cm <sup>2</sup>	42.2 l/sec*
No. 7/8	26.28 l/sec*	447.0 cm <sup>2</sup>	44.2 l/sec*
No. 9/10	27.46 l/sec*	467.0 cm <sup>2</sup>	46.2 l/sec*
No. 10/0	25.94 l/sec*	467.0 cm <sup>2</sup>	46.7 l/sec*
No. 11/12	28.60 l/sec*	487.0 cm <sup>2</sup>	47.7 l/sec*
No. 13/14	29.80 l/sec*	507.0 cm <sup>2</sup>	49.7 l/sec*
No. 15/16	31.00 l/sec*	527.0 cm <sup>2</sup>	51.7 l/sec*
No. 17/18	32.20 l/sec*	547.0 cm <sup>2</sup>	53.7 l/sec*
No. 19/20	33.40 l/sec*	567.0 cm <sup>2</sup>	55.7 l/sec*
No. 20/0	31.50 l/sec*	567.0 cm <sup>2</sup>	56.7 l/sec*

\*Safety factor  $\nu = 1,2$

**BIRCOdicht NW 300 | 0.5 % inbuilt fall**

BL = 1000 mm	Drainage performance at the channel end	Cross-section area at the channel end	Storage volume
No. 0/0	53.00 l/sec*	954.0 cm <sup>2</sup>	95.4 l/sec*
No. 1/2	58.00 l/sec*	984.0 cm <sup>2</sup>	96.9 l/sec*
No. 3/4	59.80 l/sec*	1014.0 cm <sup>2</sup>	99.9 l/sec*
No. 5/6	61.50 l/sec*	1044.0 cm <sup>2</sup>	102.9 l/sec*
No. 7/8	63.30 l/sec*	1074.0 cm <sup>2</sup>	105.9 l/sec*
No. 9/10	65.10 l/sec*	1104.0 cm <sup>2</sup>	108.9 l/sec*
No. 10/0	61.30 l/sec*	1104.0 cm <sup>2</sup>	110.4 l/sec*
No. 11/12	66.80 l/sec*	1134.0 cm <sup>2</sup>	111.9 l/sec*
No. 13/14	68.60 l/sec*	1164.0 cm <sup>2</sup>	114.9 l/sec*
No. 15/16	70.40 l/sec*	1194.0 cm <sup>2</sup>	117.9 l/sec*
No. 17/18	72.10 l/sec*	1224.0 cm <sup>2</sup>	120.9 l/sec*
No. 19/20	73.90 l/sec*	1254.0 cm <sup>2</sup>	123.9 l/sec*
No. 20/0	69.70 l/sec*	1254.0 cm <sup>2</sup>	125.4 l/sec*

\*Safety factor  $\nu = 1,2$

These diagrams can only provide the desired result in a few cases since the job definition is influenced in large part by the conditions on-site, i.e., the location of the existing drains, the number of drainage lines, etc. Therefore we recommend a hydraulic calculation from our personnel with a proposed design.

# BIRCOservice | For the environmental sector



Special solutions specific to a particular property or site are worked out at BIRCO's own workshops.



# BIRCOservice |

## Variable drainage solutions

BIRCO drainage solutions are adapted individually to your specific project in accordance with the latest construction guidelines.

### Systematic drainage solutions

#### Line drainage

Line drainage (in contrast to point drainage) consists of a line of drainage channels collecting the water flowing in from the surface and feeding this water to the drain. The channel line can also serve as an intermediate storage facility and delay drainage. Precise calculations have to be made in order for this type of channel system to work properly: The size and surface properties of the drainage area must be taken into consideration, as well as the average level of precipitation in the area. Since the adjacent surfaces and pavements have to be slanted toward the drainage line, a pavement profile generally emerges between the channel lines.



Line drainage



Line drainage with integrated gradient



Line drainage with opposing directional gradient

#### Channel panels with an integrated gradient

BIRCO channels are available both with and without an integrated gradient. The integrated gradient eases the flow of water toward the gully. A combination of channels with and without an integrated gradient can ensure rapid drainage performance.

#### Point drainage

Point drainage (in contrast to line drainage) is a system in which rainwater is collected at individual points in a decentralised fashion and fed to the drainage pipe. Accordingly, the drainage points must be located at the lowest point on the site.



## Horizontal and vertical bore holes

### Pipe connections to fit your needs

We can fit BIRCO channels with horizontal or vertical bore holes for directly fitting feed and drainage lines according to your plans. The connections available differ according to the nominal widths, extending in the standard range from DN 100 to DN 300. The diameters are matched with channel base pipes; different pipes are available upon request. BIRCO also supplies ready-made pipe connections upon

request and sludge buckets for channels with vertical bore holes.

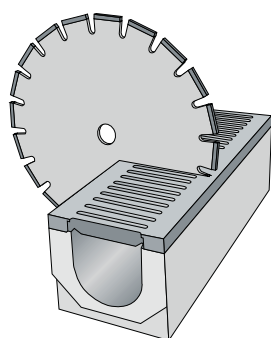
The design of the pipe connection can also be supplied with double walls. Standard components from specialist retailers are also available for the junction between the sealed PE pipe and stoneware or PVC pipe.

## Individual customisations for every nominal width

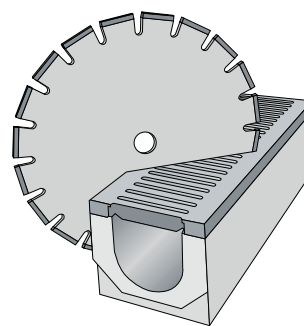
### Your plans are in good hands

BIRCO's factory service offers you a variety of customised channel panel solutions, either at a 90° angle or mitred. The concrete parts are cut including the covers so that installation at the building site can be conducted faster

and with greater precision. The cut includes the coating or galvanisation of the cut angles and covers. An end piece is welded onto grated mesh covers and galvanised, providing improved protection against rust.



Channel section 90° including cover



Mitre cut according to degree specification, including cover. Please note that two mitre cuts are required and calculated per corner connection.



# BIRCOservice |

## Optimum laying and jointing

Matching accessories for fast, uncomplicated installation. Systematic tools for smooth operation.

### Laying

#### Anchor sleeves for smooth laying

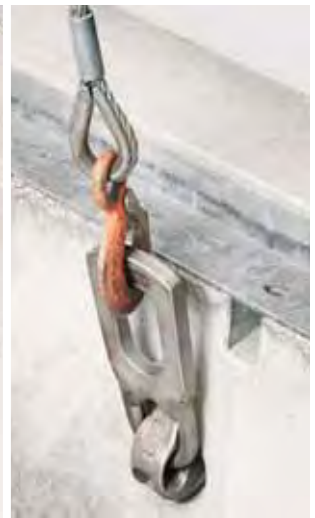
The anchor sleeves set into the channel play a valuable role when moving BIRCOsolid grid channel units. The corresponding rope eyelets can be used to grip the channel panel from the outside and move it easily.

#### Lifting anchor for precise installation

If the channel parts need to be fit precisely into a pre-assigned slot, BIRCOsolid grid channels are also fitted with interior lifting anchors. This makes moving easier, reduces digging and makes for channel laying that is improved up to 30%.



Anchor sleeve



Lifting anchor

### Fastening

#### Fast, secure, low-maintenance

BIRCO channel systems (sir, protect, solid and canal) are fitted with a solid steel combi-connection angles. This allows all types of gratings and coverings to be bolted to the channel panel up to 8 times per metre, or fastened quickly and securely with the BIRCO Easylock option. Easy-lock – one turn and everything's securely in place.

#### Only at BIRCO: Special angle casings

BIRCO frame connector casings make cleaning the threading easy. This keeps the required installation depth constant at all times. Removal or replacement of the grating works smoothly over the long term.



# Jointing with Eurolastic TC 30 S

## Jointing the channel joints | Two-flank adhesion

### A secure seal

BIRCO channel systems are manufactured from Class C 40/50 / C 30/37 concrete. All of the system panels are produced already fitted with a joint at the channel joint that has to be filled with sealant in accordance with the official WHG certification. This ensures that no liquids contaminate the ground and groundwater. The sealing joint's special shape and the execution of the jointing work as described below allow for a better completed seal that complies with the jointing requirements of Data Sheet No. 6 from the IVD ('German Industrial Sealant Association'): two-flank adhesion.

The joint at the connecting joint between two channels is preferably back-filled with a PE cord. The back-filling

material has to provide sufficient resistance once it has been installed and the sealant is applied. This is why its diameter should be approximately 1/3 larger than that of the joint width.

The PE filling cord is required for the following reasons:

- + Avoiding three-flank adhesion
- + Restricting the joint depth

This process and jointing method are known from other operations including petrol station construction. (Sealing ground joints with elastic sealants in areas subject to vehicle traffic at petrol station filling facilities – On this refer also to IVD Data Sheet No. 6.).

## Jointing with Eurolastic TC 30 S



1. Channels groove at the tongue – prior to jointing



2. Preliminary priming



3. Inserting the PE sealing cord



4. Mixing the joint sealant



5. Applying the joint sealant



6. Smoothing the surface of the sealed joint

## Cleaning and maintenance

1. We refer expressly here to the necessity for operators of facilities for the storage, filling and transfer of substances that can be hazardous to water to conduct constant monitoring of the seal tightness, respectively, the functionality of the pre-fabricated parts in accordance with Regulation on facilities for handling water-hazardous substances §1.
2. After each contact with hazardous agents, the channel systems must first be visually inspected in regard to their functionality. If necessary, additional measures must be undertaken.
3. The operator of the facility is obligated to appoint only such companies to conduct maintenance, repair and

cleaning of the pre-fabricated parts as are specialist businesses as defined by Sec. 19 i of WHG and which are referred for such work by the manufacturer, unless the required work is exempted from this obligation in accordance with applicable state legislative provisions.

4. The general maintenance instructions contained in the installation instructions for the respective product continue to apply.



### Installation instructions

- + You can find additional jointing possibilities and maintenance instructions in the installation instructions for the respective product.

# BIRCOservice |

## Advice around the clock

BIRCO provides a comprehensive ranges of advice and services, offering you our expertise personally, by phone, via the internet or on-site.

## Sharing our expertise with you – Service on-site

### **BIRCO is there for you anytime**

By phone or on-site, our experts are ready to help you find your way around the BIRCO product range, select the right channel system for your needs and answer specific questions about the arrangement and layout you need.

### **On-site throughout Europe**

BIRCO's sales team experts are at your side right from the start of your construction project in planning, problem resolution, bid tenders and implementation. Our sales reps are located throughout Europe and have years of experience and training in the very latest industrial developments.





BIRCO experts support planners and architects from the first concept through to laying, at the drawing board and every day at the building site.

## BIRCOonline

### Information at a single mouse click

In addition to personal consultation, you can also order all of our product information by post, e-mail or via the internet.

### Download Center

At the Download Centre you can find installation instructions, technical information and much more in PDF file form. On the data pages, you can create PDF files of daily technical data updates.

## BIRCOsales team

Your internal customer service representative can always be reached by phone or e-mail, ready to assist you with inquiries, advice and expert knowledge.

We also rely on a continuous trusting cooperation with regional dealerships. This network benefits you in product inquiries and logistics.

[www.birco.de](http://www.birco.de)



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## Environment

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