BIRCOsir | Installation Instructions

A number of details must be observed when installing BIRCOsir.
For a comprehensive description please read here.

To guarantee smooth operation and compliance with the requirements of DIN EN 1433, the following general 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 BIRCOsir channels is conducted on an earth-moist C 25/30 strip of foundation concrete at least 15 cm high which must be haunched both sides. No additional concrete surround or reinforcement on the sides is required[(1)]. Begin laying the channel line following the outfall unit 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.

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 transverse 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 joint.

5. BIRCO drainage units are fitted with a safety sealing joint on the channel end. In accordance with DIN EN 1433, once laying has been completed this safety seam can be further treated with a plastic modified mortar or a permanently elastic sealing material (for example SF-Connect).

6. Proceed analogously when installing the outfall unit.

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”.

[(1)]Exception:
When using BIRCOsir 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.

Fast, safe installation | Efficient time & cost management

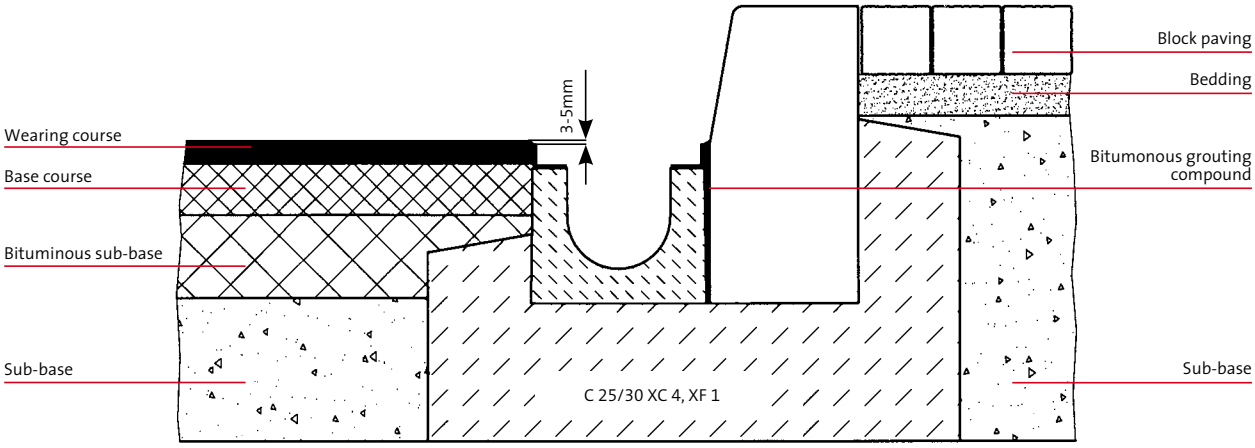
+ The one-piece Type M channel unit only needs partial concrete surround, reducing casing and concrete casting work.

BIRCOsir Installation Examples

Installation instructions for traffic areas with heavy wheel loads.
Urban construction | Industrial construction | Parking lots

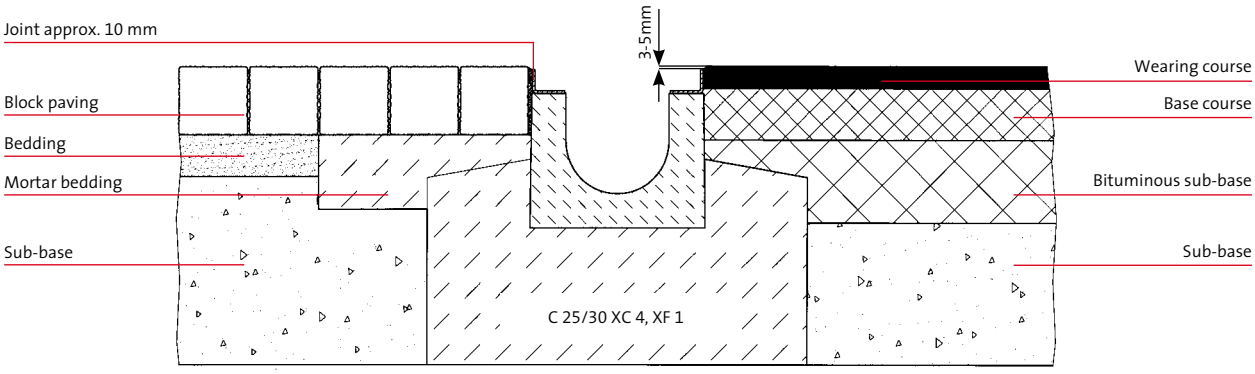
Load Class A 15 to E 600, Type M, NW 100 – 1000

Drawings No. 8619, 8620, 8622, 8623, 8624



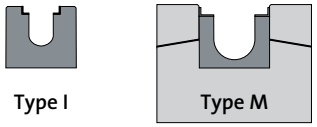
Load Class A 15 to E 600, Type M, NW 100 – 1000

Drawings No. 8619, 8620, 8622, 8623, 8624



Introduction to 2 models

+ **Type I:** Requires no load-bearing foundation and/or no full concrete surround: e.g., BIRCOmassiv.
+ **Type M:** Requires a load-bearing foundation and/or full concrete surround: e.g., BIRCOsir.



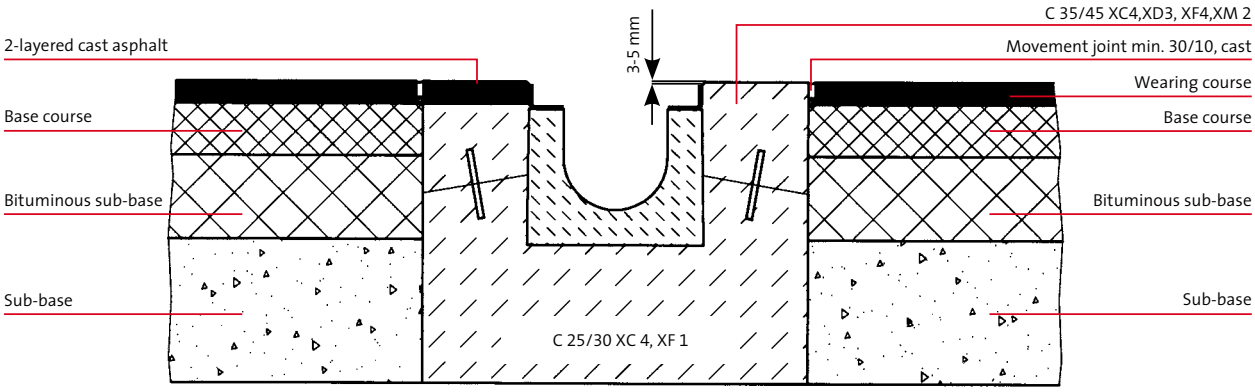
Constructed in accordance with RSTO using non-settling frost-free sub-bases.
Exception up to D 400: Not for use across the carriage- way of highways or motorways.

BIRCOsir Installation Examples

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

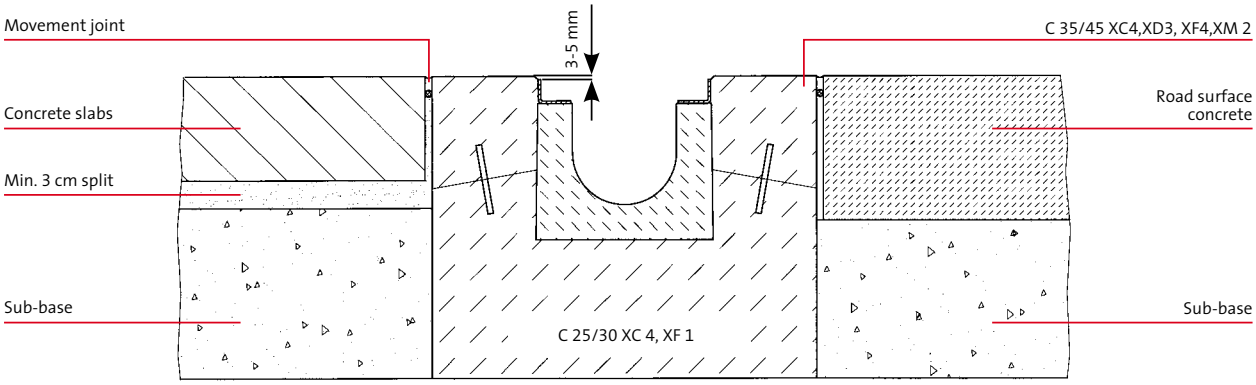
Load class D 400 to F 900, Type M, NW 100 – 1000

Drawings No. 8619, 8620, 8622, 8623, 8624



Load class D 400 to F 900, Type M, NW 100 – 1000

Drawings No. 8619, 8620, 8622, 8623, 8624



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.

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

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 surround, then dowel bars or flotation control made of Ø 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.

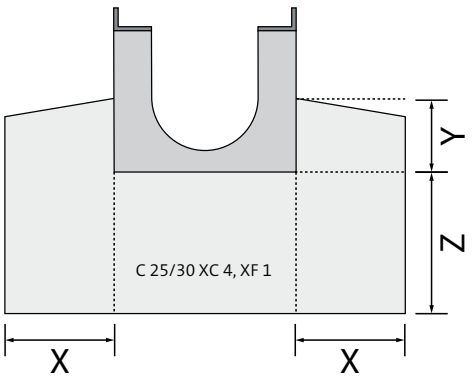
Bolt connection note:
For heavy-duty load areas subjected to frequent traffic and in vehicle monoevering areas, we recommend using threaded bolts instead of fast connection systems (such as Easylock). Torque moments for screw fastening the gratings are to be set at M12 = 60 Nm, M16 = 100 Nm.
The bolts must be re-tightened at regular intervals.

BIRCOsir concrete surround overview

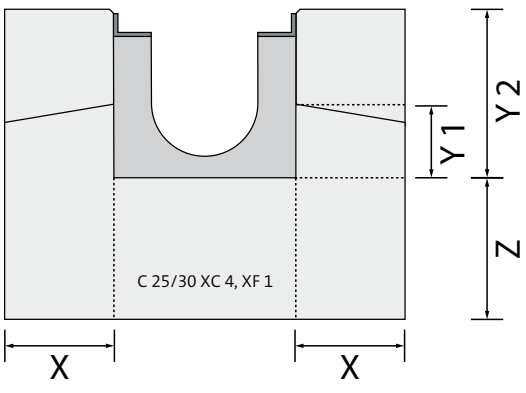
The manufacturer's installation instructions must be followed in order to comply with the requirements stipulated by DIN EN 1433.

BIRCOsir

NW	Type	Load class	X	Y/Y 1	Y 2	Z	Drawing No.	Page
BIRCOsir 100	M	A 15 – E 600	≥ 150	≥ 100	–	≥ 200	8619	55
BIRCOsir 100	M	D 400 – F 900	≥ 150	≥ 100	Construction height + 5 mm	≥ 200	8619	56
BIRCOsir 150	M	A 15 – E 600	≥ 150	≥ 100	–	≥ 200	8620	55
BIRCOsir 150	M	D 400 – F 900	≥ 150	≥ 100	Construction height + 5 mm	≥ 200	8620	56
BIRCOsir 200 AS	M	A 15 – E 600	≥ 150	≥ 100	–	≥ 200	8622	55
BIRCOsir 200 AS	M	D 400 – F 900	≥ 150	≥ 100	Construction height + 5 mm	≥ 200	8622	56
BIRCOsir 300 AS	M	A 15 – E 600	≥ 200	≥ 100	–	≥ 200	8623	55
BIRCOsir 300 AS	M	D 400 – F 900	≥ 200	≥ 100	Construction height + 5 mm	≥ 200	8623	56
BIRCOsir 400	M	A 15 – E 600	≥ 200	≥ 200	–	≥ 200	8624	55
BIRCOsir 400	M	D 400 – F 900	≥ 200	≥ 200	Construction height + 5 mm	≥ 200	8624	56
BIRCOsir 500	M	A 15 – E 600	≥ 200	≥ 200	–	≥ 200	–	55
BIRCOsir 500	M	D 400 – F 900	≥ 200	≥ 200	Construction height + 5 mm	≥ 200	–	56
BIRCOsir 1000	M	A 15 – E 600	≥ 200	≥ 250	–	≥ 250	–	55
BIRCOsir 1000	M	D 400 – F 900	≥ 200	≥ 250	Construction height + 5 mm	≥ 250	–	56



Installation without concrete surround



Installation with concrete surround

BIRCOsir Drainage Capacities

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

BIRCOsir 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 cm²
No. 1	8.25 l/sec*	99.0 cm²
No. 2	9.08 l/sec*	109.0 cm²
No. 3	9.92 l/sec*	119.0 cm²
No. 4	10.75 l/sec*	129.0 cm²
No. 5	11.58 l/sec*	139.0 cm²
No. 5/0	7.72 l/sec*	139.0 cm²
No. 6	12.42 l/sec*	149.0 cm²
No. 7	13.25 l/sec*	159.0 cm²
No. 8	14.08 l/sec*	169.0 cm²
No. 9	14.92 l/sec*	179.0 cm²
No. 10	15.75 l/sec*	189.0 cm²
No. 10/0	10.50 l/sec*	189.0 cm²
No. 11	16.58 l/sec*	199.0 cm²
No. 12	17.42 l/sec*	209.0 cm²
No. 13	18.25 l/sec*	219.0 cm²
No. 14	19.08 l/sec*	229.0 cm²
No. 15	19.92 l/sec*	239.0 cm²
No. 15/0	13.30 l/sec*	239.0 cm²

*Safety factor ν = 1.2

BIRCOsir 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 cm²
No. 1	12.29 l/sec*	208.5 cm²
No. 2	12.73 l/sec*	216.0 cm²
No. 3	13.17 l/sec*	223.5 cm²
No. 4	13.61 l/sec*	231.0 cm²
No. 5	14.05 l/sec*	238.5 cm²
No. 5/0	13.25 l/sec*	238.5 cm²
No. 6	14.50 l/sec*	246.0 cm²
No. 7	14.94 l/sec*	253.5 cm²
No. 8	15.38 l/sec*	261.0 cm²
No. 9	15.82 l/sec*	268.5 cm²
No. 10	16.26 l/sec*	276.0 cm²
No. 10/0	15.33 l/sec*	276.0 cm²
No. 11	16.71 l/sec*	283.5 cm²
No. 12	17.15 l/sec*	291.0 cm²
No. 13	17.59 l/sec*	298.5 cm²
No. 14	18.03 l/sec*	306.0 cm²
No. 15	18.47 l/sec*	313.5 cm²
No. 15/0	17.42 l/sec*	313.5 cm²
No. 16	18.92 l/sec*	321.0 cm²
No. 17	19.36 l/sec*	328.5 cm²
No. 18	19.80 l/sec*	336.0 cm²
No. 19	20.24 l/sec*	343.5 cm²
No. 20	20.68 l/sec*	351,0 cm²

*Safety factor ν = 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.

BIRCOsir NW 200 AS | 0.5 % inbuilt fall

CL = 1000 mm	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	20.89 l/sec*	367.0 cm²
No. 1	22.75 l/sec*	386.0 cm²
No. 2	23.33 l/sec*	396.0 cm²
No. 3	23.92 l/sec*	406.0 cm²
No. 4	24.51 l/sec*	416.0 cm²
No. 5	25.10 l/sec*	426.0 cm²
No. 5/0	23.67 l/sec*	426.0 cm²
No. 6	25.69 l/sec*	436.0 cm²
No. 7	26.28 l/sec*	446.0 cm²
No. 8	26.87 l/sec*	456.0 cm²
No. 9	27.46 l/sec*	466.0 cm²
No. 10	28.05 l/sec*	476.0 cm²
No. 10/0	24.44 l/sec*	476.0 cm²
No. 20	32.00 l/sec*	576.0 cm²

*Safety factor ν = 1.2

BIRCOsir NW 300 AS | without inbuilt fall

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0, construction height 1	43.8 l/sec*	789.0 cm²
No. 0/0, construction height 2	67.0 l/sec*	1209.0 cm²

BIRCOsir NW 400 | without inbuilt fall

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	74.91 l/sec*	1348.0 cm²

BIRCOsir NW 500 | without inbuilt fall

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	133.3 l/sec*	2400.0 cm²

BIRCOsir NW 1000 | without inbuilt fall

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	252.8 l/sec*	4550.0 cm²

*Safety factor ν = 1.2

Hole drilling horizontal and vertical

We can fit BIRCOsir 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. BIRCO also supplies ready-made pipe connections and silt buckets with vertical drilling upon request.

BIRCOsir | Maximum bore hole diameter

NW	Bore hole, horizontal maximal	Bore hole, 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
500 mm	DN 300	DN 300
1000 mm	DN 300	DN 300

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

BIRCOservice Page 107

\+ BIRCO offers you an individual customisation and bore hole service ex-factory.