



GRASPOINTNER
Sustainable innovation.



One element,
all strengths.

 **FILCOTEN[®]**
one

The monolithic
drainage system

The **first** of its kind – and the most **sustainable.**

The simple ideas are often the best. The new, revolutionary FILCOTEN® one is a good example. Channel and grating cast in one piece – for the first time made from the most innovative material on the market: FILCOTEN® HPC (High Performance Concrete).

Made from one piece, brilliantly simple.

We have invested a lot of work – and the investment has paid off: Many hours of construction, design, planning and testing brought about a one-of-a-kind product that combines a great number of exceptional properties – the first of its kind.

Monolithic structure, environmentally-friendly in many ways.

FILCOTEN® HPC combines excellent properties with sustainability. Therefore, the new FILCOTEN® one is a class of its own when it comes to environmental friendliness. 100% recyclability, certified absence of harmful substances and extremely low greenhouse gas emission levels are beneficial for both humans and the environment.

Inflow opening in the channel joint

Inflow opening in the joint
with standard slot width
for ideal water drainage

Tongue and groove system for installation in either direction

- non-directional channel joint for easy and fast installation
- interlocking of the groove/tongue/cone system for accurate, aligned setting of the elements
- predefined distance in the joint for optimum function of the insertable sealing profile

Highly efficient flume

- channel cross-section with innovative corrugated W-profile design for optimum hydraulic performance on partial and complete filling
- high self-cleaning effect of the W-profile causing turbulences in the inflowing water

Easy-to-handle sealing system

- preformed groove on the front/end sides for easy insertion of the sealing profile
- permanent joint sealing through tight fit of the groove/tongue/cone system
- requirements according to EN 1433



Optimized inflow openings

- slot widths according to EN 1433
- innovative S-design for efficient rainwater inflow

Cyclist- and pedestrian-friendly

- counter-rotating radial arrangement of the inflow openings
- safe to drive and walk over thanks to the S-design of the double slots

Monolithic structure

- element made entirely of FILCOTEN® HPC
- extremely robust and wear resistant
- ideal for dynamic exposure in road traffic

Verified LCA (life cycle assessment)¹⁾

- low greenhouse gas emission levels
- produced using exclusively green power
- resource-efficient production process



Extremely Durable hold in the concrete bed

- lateral anchoring pockets for maximum anchorage in the concrete bed
- permanent fit in the foundation thanks to identical linear expansion coefficient
- perfect connection between HPC and concrete

One solution for all kinds of applications.

FILCOTEN® one is the first choice wherever heavy dynamic loads may occur. The reason is obvious: Thanks to its monolithic structure and the sophisticated design, it combines an unprecedented number of benefits in one channel system.

An overview of applications:

- industrial spaces
- logistic centers
- airports
- highway median strips
- temporary highway crossings due to construction
- railway crossings
- roundabouts
- harbours
- parking facilities
- asphalt surfaces

¹⁾ According to ISO 14040, ISO 14044, EN 15804 | ²⁾ No use of synthetic resins

Well thought-out elements make an outstanding **system.**

What is a good drainage system all about? Quite simply, it must be more than the sum of its parts. When developing FILCOTEN® one, from the start, we always focused on the entire system, not just on the individual single parts.

Intelligent solutions for your requirements

We achieved a great number of intelligent solutions for more efficiency, performance and, above all, easy and safe handling – from the first installation to the daily use through to routine maintenance.

One grating – one design

- consistent continuation of the S-design also for the cast iron grating
- edge and grating, cathodic dip-coated
- 4-point bolting
- class F900



Basic channel NW200, NW150

- standard construction height no. 0
- total length of element 1.000 mm

Revision element

- maintenance access in the style of the channel run
- cast iron grating in S-design, 4-point bolting
- total length of element 1.000 mm



Front/end cap

- with tongue and groove system
- closure of front/end sides of the channel run

End cap with outlet

- with tongue and groove system
- closure of run with socket DN 200 (KG-coupling)

Easy access

- simple cleaning of the outlet unit
- large drain hole in channel bottom for attaching the sediment bucket
- total length 1.000 mm

Adapter cap

- for stepped slope installation
- from no. 0 to 40-0 height

Retention & stepped slope

- 40-0 height (20 cm higher than no. 0)
- for higher hydraulic requirements
- longer channel runs possible up to one outlet point
- for retention (additional volume: 40 l/m)

Class D400 – F900

Outlet unit

- socket DN 200 (KG-coupling)
- tight connection of pipework

Lived sustainability: FILCOTEN® HPC (High Performance Concrete)

- cement-bound, mineral material
- extremely durable, stable and UV-resistant
- extremely resistant to frost, de-icing salt, oil, gasoline
- 100% recyclable, certified¹⁾
- certified environmental and energy management according to ISO 14001 or 50001 at the location of Oberwang/AT
- tested by the IBR²⁾ – safe in terms of building biology

¹⁾ in accordance with the guidelines of the Austrian Construction Materials Recycling Association | ²⁾ Institute for Building Biology Rosenheim

Works LEFT OR RIGHT...

Tongue & groove & tenon system for easy installation.

Developing innovative products means always thinking one step ahead to offer benefits to customers even in the slightest details. This also includes the question of how the installation of a drainage channel could be realized even more easily.

The efficient way is always better.

Our response: an innovative tongue & groove & tenon system for direction-independent and considerably easier and faster installation of FILCOTEN® one. The new smart sealing system* prevents water leaking between the channel elements and guarantees uncomplicated handling.

Innovation for increased precision: Wedge-shaped connectors enable precise connection of the channel elements and keep them at the correct distance for the sealing profile to work optimally.



Direction-independent installation: The design of the tongue & groove & tenon system at the face end ensures that the channel elements match in any direction of installation. Installation becomes easier and more efficient.



Precise fitting: Thanks to the half-side tongue & groove & tenon system, the channels are exactly aligned in a longitudinal direction when connected, without any lateral shifting. At the same time, the chamfered base offers sufficient "space" for installation mortar.



Bottom view

Side view



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... and seals **TIGHTLY.**

Smart sealing system.

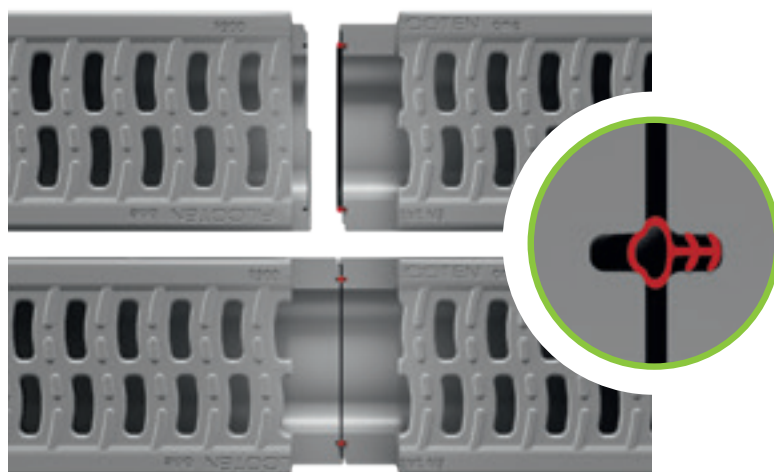


Easy handling included:

The sealing is simply inserted into the circular groove at the face side of the element. Moulded lamellas stop the sealing slipping out of the groove.

Fitting on both face sides for outstanding sealing performance:

When fitting a drainage channel, only one sealing profile is required per drainage joint, and is pressed into the free groove of the facing element thanks to the precisely fitting tongue & groove & tenon system. This way, the joint is sealed tightly.

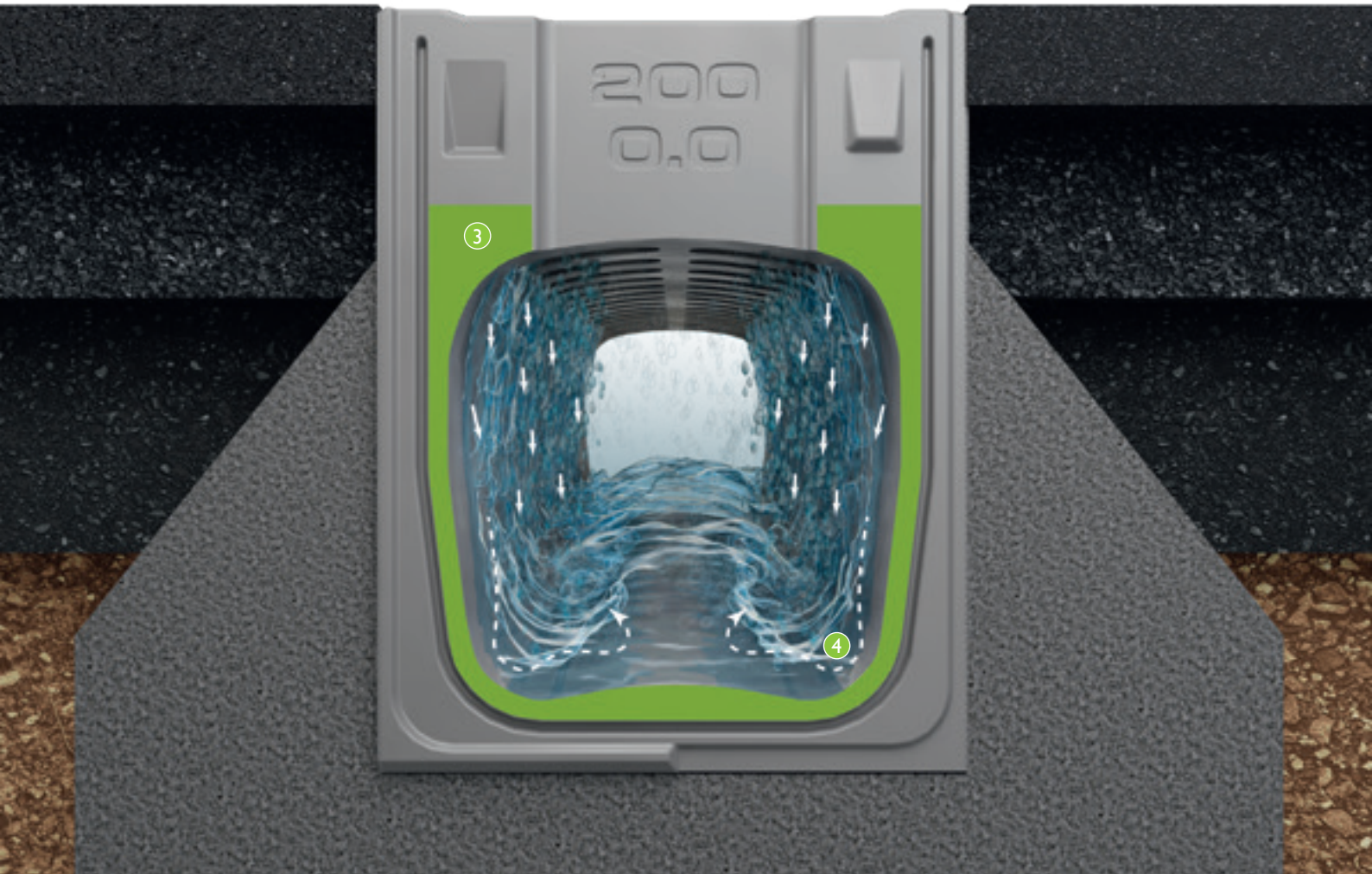


**The sealing system is optional.*

Water flow at any time.

Good design always serves a specific purpose – and the purpose of a drainage channel is very clear:

The surface water is to be drained as efficiently as possible. Based on this criterion, the design of FILCOTEN®one is simply fantastic.



③ W-profile for any rainwater discharge

- light rain quantities are quickly drained in the two lateral W-chambers
- for stronger rain the high-capacity W-profile offers maximum hydraulic capacity and water spreading volume

④ Targeted turbulences ensure constant cleaning

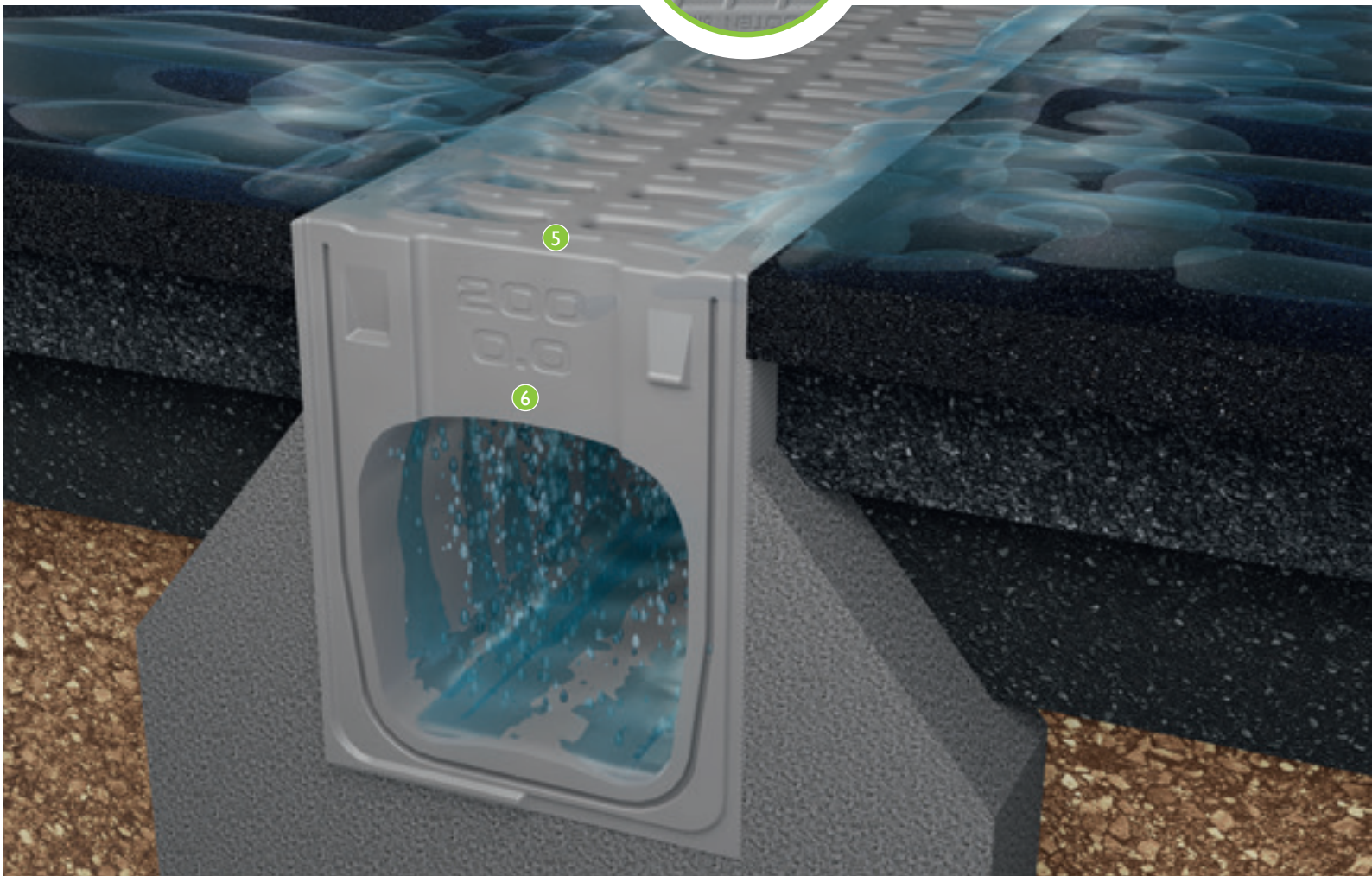
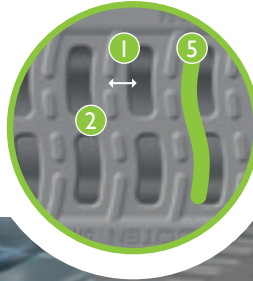
- the chambers at the side of the W-profile ensure targeted turbulences of the rainwater
- these turbulences generate a constantly high self-cleaning effect
- even during light rain, thorough and efficient cleaning of the system is ensured

1 Perfectly dimensioned inlet openings

- large enough to enable a high rainwater inflow for quick draining
- at the same time, small enough to prevent the entry of coarse dirt and hold it back on the top surface of the drainage system

2 Structured surface for more grip

- grating surface has anti-slip structure
- maximum grip when driven over longitudinally or diagonally



5 Innovative inlet openings with S-shaped design

- EN1433 compliant inlet opening precisely above the W-profile of the drainage base
- optimised inlet and minimised overflow of surface water thanks to grating surface with innovative S-shaped design

6 FEM-optimised design

- monolithic drainage system FEM-optimised F900
- structurally tailored design in every detail, e.g. strength and structure of the spans



Proven sustainability that can be **seen** & leaves a lasting impression

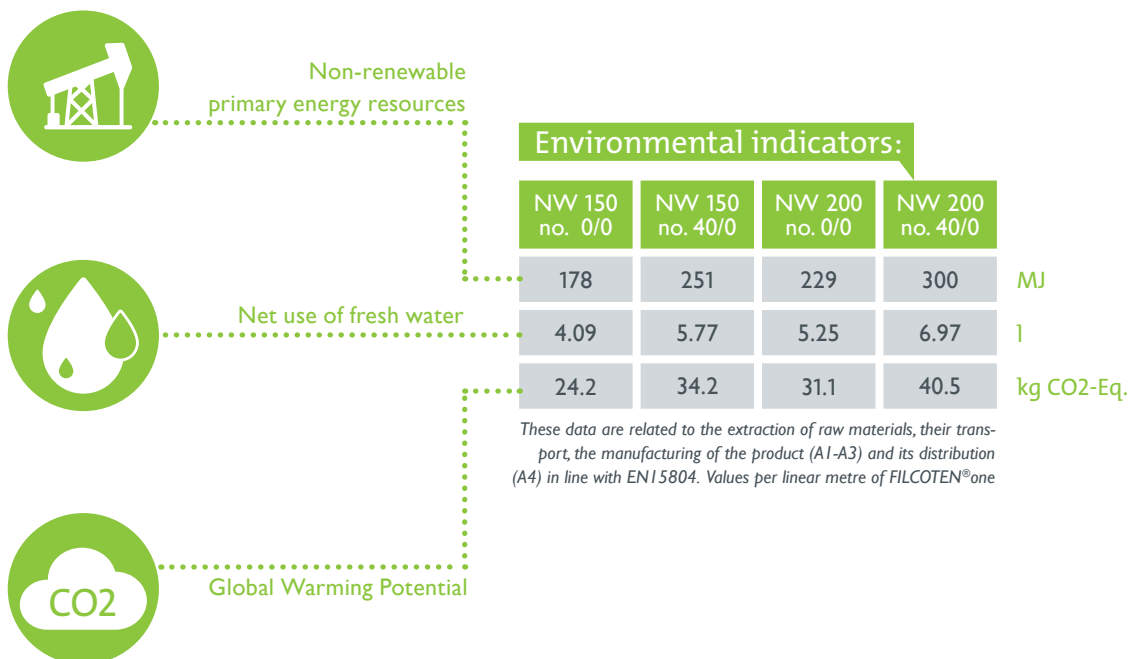
Today, many companies claim sustainability credentials, but the key question is: How much of this is backed up by hard facts behind the green facade?

Full transparency – nature deserves it.

With FILCOTEN®one, we are following a unique path of total transparency and have subjected the system to rigorous, independent environmental analysis¹⁾. That takes the form of a **Life Cycle Assessment** in line with ISO 14040 & ISO 14044 or EN 15804 and using recognized indicators such as the Global Warming Potential (GWP), Cumulative Energy Expenditure (CEE), Abiotic Resource Use (ARU) or testing water usage.

We play with our cards on the table – and even let others look over our shoulder.

To confirm our transparent data, the product Life Cycle Assessment for phases A1–A4 was subsequently verified by external experts²⁾ in line with EN 15804.



Analysed and verified by:



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¹⁾ ECODESIGN company – www.ecodesign-company.com

²⁾ ESU-services GmbH – www.esu-services.ch

Sustainable in every respect,
high-performance down to the last fibre,
or simply **FILCOTEN®**.

Sustainability and innovation are the central components of our company culture. That can be seen from the materials, the manufacturing processes and the energy used. It is not for nothing that we are a member of Climate Alliance Austria, the largest municipal climate protection network in Austria. FILCOTEN® HPC (High Performance Concrete) is thus not just a highly advanced material but ultimately the result of all our efforts to create cutting-edge technology that is in harmony with nature.

Environmentally friendly production process.

We focus on environmental protection in the production process, too – be it when selecting raw materials or avoiding unnecessary waste. Accordingly, we have implemented a certified environmental/energy management scheme in line with ISO 14001 and 50001 at our site in Oberwang, Austria.

Mineral raw material, recyclable and energy-efficient.

FILCOTEN® HPC is a mineral raw material that is 100% recyclable (certified by BPS GmbH, the Upper Austrian soil and construction materials test centre) and free from resins or solvents. To manufacture it, we rely 100% on green electricity and have nearly completely dispensed with the use of fossil fuels.

Certified: non-toxic.

- meets the strict criteria of the Rosenheim Institute for Building Biology (IBR)
- not harming people's health and the environment
- guaranteed to be ecologically safe as it is tested for biocides, solvents, VOC, heavy metals and radioactivity



**Climate Alliance
Partner**

BG green electricity:

As of 2016

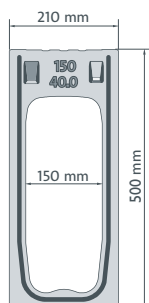
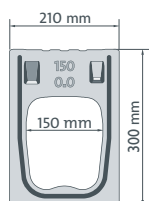
80.06 %	Hydroelectric power
9.57 %	Solid or liquid biomass
8.48 %	Wind power
1.89 %	Other green energy
100 %	Sustainable energy mix





FILCOTEN[®] one

Nominal width 150, 200



FILCOTEN[®] one, nominal width 150 mm

Monolithic channel made of FILCOTEN[®] HPC (High Performance Concrete) Class D400-F900

Item no.	monolithic channel body up to cl. F - without slope	Weight
15015100	FILCOTEN one NW 150, no. 0, L = 1000 mm, SW 23/52 mm	76.6 kg
15015168	FILCOTEN one NW 150, no. 40-0, L = 1000 mm, SW 23/52 mm	107 kg

FILCOTEN one NW 150: Inlet cross-section 370 cm²/m

Accessories

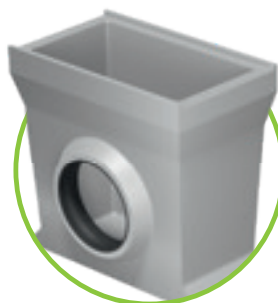
for FILCOTEN[®] one, nominal width 150 mm

Item no.	Accessories	Weight
15015180	Maintenance unit with ductile iron grating, no. 0, L = 1000 mm ¹⁾	82.7 kg
15015188	Maintenance unit with ductile iron grating, no. 40-0, L = 1000 mm ¹⁾	111.3 kg
15015170	Outlet unit upper part, with ductile iron grating, no. 0, L = 1000 mm ¹⁾	79.4 kg
15015178	Outlet unit upper part, with ductile iron grating, no. 40-0, L = 1000 mm ¹⁾	108 kg
19115095	Outlet unit lower part, outlet DN 150	
22510	BG sediment bucket for sump unit, plastic	0.37 kg
30030	BG odour trap made of PVC bends DN 150/87°, plastic	3.9 kg
30057	BG drain trap for sump unit for backfitting DN 150, plastic	0.2 kg
19115100	Front /end cap, no. 0 , without outlet	
19115108	Front /end cap, no. 40-0, without outlet	
19115110	End cap with outlet, no. 0, outlet DN 150	
19115118	End cap with outlet, no. 40-0, outlet DN 150	
19115157	Adapter cap for stepped slope no. 0 / 40-0	9.09 kg
	²⁾ Profile for joint sealing	

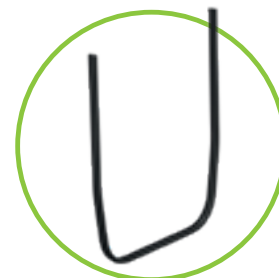
¹⁾ c.l. F 900 type M, Set of monolithic channel, cast-iron edge and bolted ductile iron grating



Outlet or maintenance unit
with ductile iron grating



Outlet unit -
lower part



²⁾ Is a joint sealing profile required?
Please contact our Service-Team.



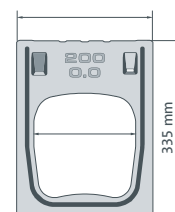
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FILCOTEN® one, nominal width 200 mm

Monolithic channel made of FILCOTEN® HPC (High Performance Concrete) Class D400-F900

Item no.	monolithic channel body up to cl. F - without slope	Weight
15020100	FILCOTEN one NW 200, no. 0, L = 1000 mm, SW 23/70 mm	99 kg
15020168	FILCOTEN one NW 200, no. 40-0, L = 1000 mm, SW 23/70 mm	131.5 kg

FILCOTEN one NW 200: Inlet cross-section 510 cm²/m

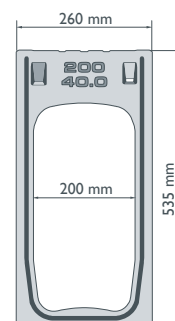


Accessories

for FILCOTEN® one, nominal width 200 mm

Item no.	Accessories	Weight
15020180	Maintenance unit with ductile iron grating, no. 0, L = 1000 mm ^{1.)}	105 kg
15020188	Maintenance unit with ductile iron grating, no. 40-0, L = 1000 mm ^{1.)}	133 kg
15020170	Outlet unit with upper part, ductile iron grating, no. 0, L = 1000 mm ^{1.)}	87 kg
15020178	Outlet unit with upper part, ductile iron grating, no. 40-0, L = 1000 mm ^{1.)}	119 kg
19120095	Outlet unit lower part, outlet DN 200	35.5 kg
22511	BG sediment bucket for sump unit, plastic	0.7 kg
30040	BG odour trap made of PVC bends DN 200/87°, plastic	7.4 kg
19120100	Front /end cap, no. 0, without outlet	1.4 kg
19120108	Front /end cap, no. 40-0, without outlet	
19120110	End cap with outlet, no. 0, outlet DN 200	1.8 kg
19120118	End cap with outlet, no. 40-0, outlet DN 200	
19120157	Adapter cap for stepped slope no. 0 / 40-0	12.5 kg
	^{2.)} Profile for joint sealing	

^{1.)} cl. F 900 type M, Set of monolithic channel, cast-iron edge and bolted ductile iron grating



End cap
with outlet



Front /end cap
without outlet



Adapter cap for
stepped fall no. 0 / 40-0

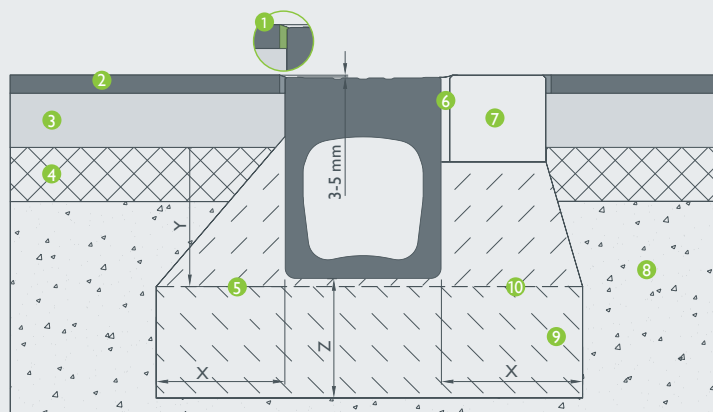
General notes

The following installation guidelines and examples are intended for standard use. The load class and the installation according to EN1433 must be adapted to the conditions on site by the planner. The technical rules and regulations generally known in specialist circles must be taken into account during installation. In special cases, contact the BG applications engineering department.

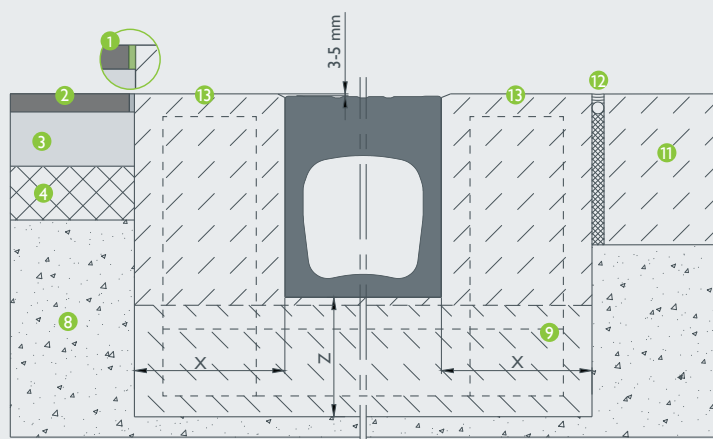
Installation guidelines for FILCOTEN® one

1. FILCOTEN® channels are to be aligned on a concrete foundation in line with the Austrian standard B4710-1 or in single-sized concrete in line with RVS 08.18.01. When the foundations are cured, channel elements have to be put in a bed of high-strength mortar of at least 2-3cm. Depending on the structural requirements, support concrete wedges on each side of the channel or concrete stretchers with steel reinforcement are required – see table and sectional views for details.
2. Start setting up the linear run at the outlet unit, ensuring that the lower part of the outlet unit is at the right height and position to connect with the sewer pipe and the linear channels. If there are several outlet units in one linear run, the lower parts of the outlet units must be installed particularly carefully at the right height and position. Each FILCOTEN® one element can be connected to the previous element at either end, as the tongue & groove & tenon system allows for any flow direction. As a result, there is no flow direction arrow on the elements.
3. When laying the channels, the interlocking joints between the individual lengths can be sealed with a slot-in sealing profile or with conventional sealing materials (e.g. 1-component PU-based sealing materials), the BG applications engineering department will provide you with a description of the materials and determine the quantities required.
4. Before the surface layer is laid, the channels should be protected to avoid concrete spills on the surface, e.g. with protective plastic sheeting.
5. When sealing the upper structure and the surface layer (asphalt, paving, concrete, etc.), make sure that the channels are not damaged.
6. If lateral forces may occur (e.g. concrete surfaces, slopes etc.), sufficiently sized expansion joints must be installed in the road surface, at a distance of 30-200 cm from the channel run. Expansion joints extending transversely across the run are to be arranged in the pavement that they run through a channel joint.
7. If shear forces occur, paved surfaces have to be installed comparable to a stretcher stone. This can be done by placing the first three rows of paving (at the channel run) in a mortar bed. The joints must be backfilled with mineral materials. Shear forces from the paved surface may not have direct impact on the channel walls (e.g. thermal expansion, braking forces, etc.). The respective technical guidelines for the production of bonded or unbonded paved surfaces must be observed accordingly.
8. All adjacent surface layers should always be 3-5 mm higher than the surface of the channel to avoid mechanical damage to the channel elements and to ensure the water can drain away.
9. The same installation guidelines apply accordingly to inspection and outlet units (incl. upper/lower parts).
10. The channel system must be checked regularly (at least once a year) to ensure that it is free from dirt and functioning correctly and, if necessary, cleaned – especially the outlet unit, incl. sediment bucket.





- 1 bituminous joint strip
- 2 surface layer
- 3 bitumen gravel
- 4 load-bearing bitumen layer
- 5 class E: with iron dowel
Ø 8 mm e = 200 mm
- 6 hole-free cast joint
- 7 large-format stretcher
- 8 load-bearing gravel layer
- 9 concrete foundation acc.
to static calculations
- 10 working joint
- 11 concrete pavement
- 12 expansion joint
- 13 expansion/dummy joints
in concrete stretcher, steel
reinforcement acc. to
static calculation



Load Class	C 250 kN	D 400k kN	E 600 kN	F 900 kN
concrete quality acc. to DIN EN 206-1 *	≥ C 20/25	≥ C 25/30	≥ C 25/30	situation-specific
width: X	≥ 15 cm	≥ 20 cm	≥ 25 cm	on request
height: Y	channel height - 10 cm	channel height		
thickness: Z	≥ 15 cm	≥ 10 cm	≥ 15 cm	on request
Exposure class of concrete for foundation:	(X0)			on request

* Concrete quality is a minimum requirement and has to be adapted to the site conditions.

The installation drawings are generally applicable examples.
Details and further information on our homepage www.graspointner.at.
For special installation requirements, you can also contact our Technical Service
Department directly.





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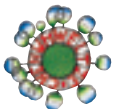
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greenprint*
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* Our contribution to the reforestation project of BOKU Wien in Ethiopia.



Your Partner for BG-Graspointner Drainage Systems

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