GRASPOINTNER
Sustainable innovation.

The evolution of the revolution.

BG-FILCOTEN® green

The line drainage system with technical filter.

When old **strengths** meet the latest **technology.**

Can a revolutionarily good product be made even better? Can an extremely environmentally-friendly drainage channel be even more ecological? It can – as the new BG-FILCOTEN® green proves:

Even more efficient filtering of drainage water.

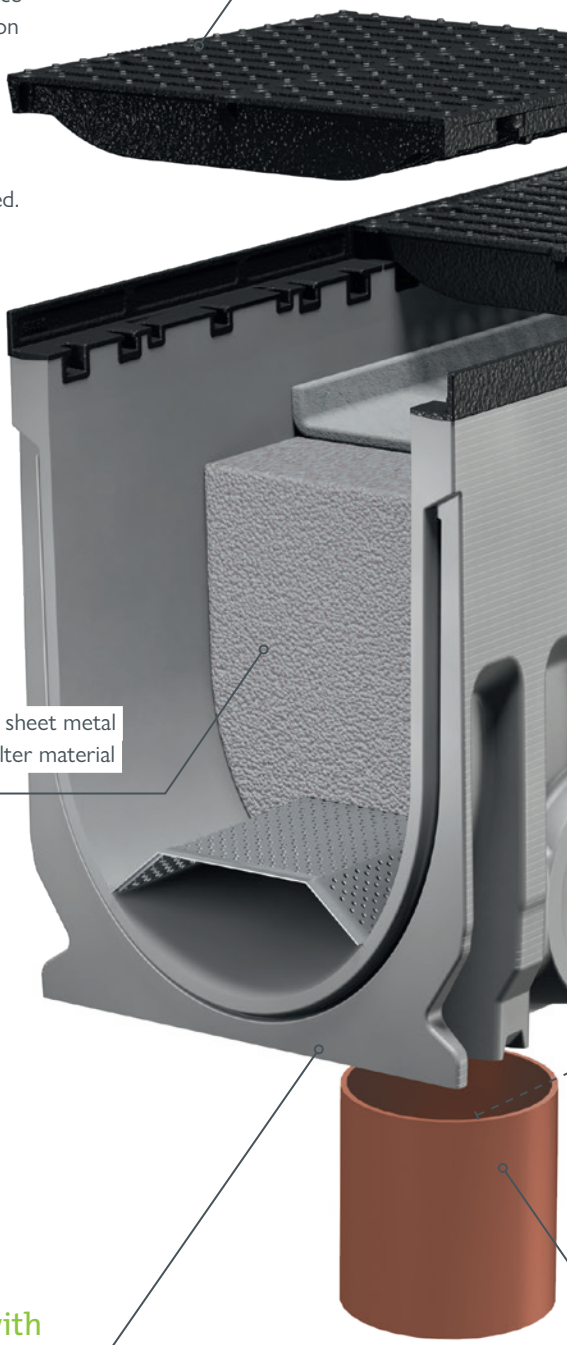
We have optimized the integrated technical filter even further based on intensive research and development. The new BG-FILCOTEN® green now rids the surface water of pollutants more efficiently than ever. To ensure even greater protection of the water cycle.

The perfect combination of drainage and retention.

With a new nominal width of 400 mm as well as an optimized channel body, the channel's drainage and retention capacities have been considerably increased. Sustainability and efficiency in perfect harmony.

up to class E 600

ÖNORM GEPRÜFT BY AUSTRIAN STANDARDS – ViaClean Plus filter material [1], ÖNORM tested, B2506-3 No.: N 00970, origin class A, max. As: Ared 1:150 //



Ductile iron slotted grating

- available in class E 600

Innovative, extremely high-performance filter unit

- high-performance filter material
- Prefilter non-woven material ensures thorough precleaning
- Trapezoid-shaped, stainless steel perforated sheet metal optimises water flow and retention of the filter material

end cap

- end cap with DN 150 outlet
- transports the water through a connection into the sewage pipe
- made from stainless steel

Optimised channel body with a nominal width of 400 mm

- greater drainage capacity
- larger retention volume

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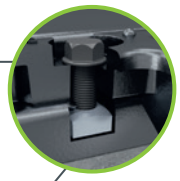
boltable gratings

- ductile iron grating E 600 with 4-point bolting for safe and durable connection
- integrated pins to prevent longitudinal shifting



Robust drainage channel in high-strength FILCOTEN® HPC (High Performance Concrete)

- lateral anchoring pockets for a durable hold in the concrete bed
- integrated ductile iron edges, KTL-coated
- smooth side walls for perfect pavement fit

Front cap

- for a clean end to a channel line
- made from stainless steel

New two-meter construction length

- fewer butt joints
- more efficient installation of the channel runs

Efficiently supplies filtered rainwater:

- cistern for rainwater use
- retention basin
- sump units (see page 12)
- approved for return supply into the water (outlet channel)
- storm drain

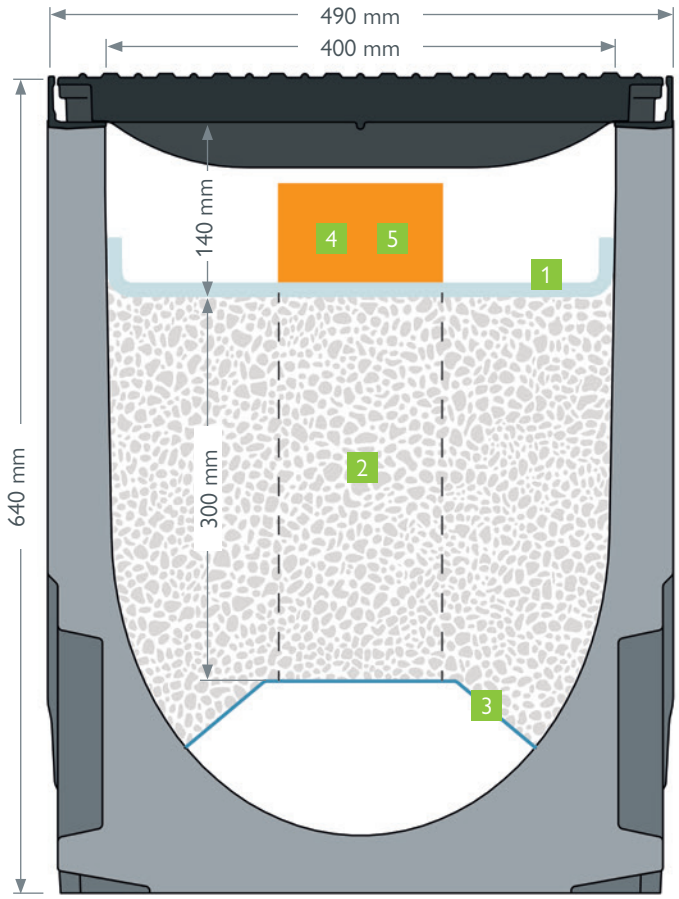
Areas of application:

- logistics area
- parking area (car)
- parking area (truck)
- workshops
- storage area

[1] *The BG-FILCOTEN® green water treatment system is equipped and sold exclusively with ÖNORM B 2506-3 tested filter material. BG-Graspointner GmbH reserves the right to replace the advertised Mall "ViaClean plus" filter material, Test Number N 001970, with a comparable, ÖNORM B 2506-3 certified product where appropriate.*

We are setting a new purity standard for surface water.

The BG-FILCOTEN® green features an innovative filter system, enabling superior cleaning performance. The system is also simple to install and exceptionally easy to maintain.



1 Pre-filter fleece for efficient preclearing.

- Pre-filter fleece keeps out coarse dirt, protecting the high-quality technical filter material
- Very easy to install, maintain and replace

2 Powerful integrated technical filter.

- **In accordance with ÖWAV RB 45** [1)]
- Multiple applications
- Excellent efficiency as well as high and lasting cleaning performance

2 Innovative cleaning filter material.

- **Tested in accordance with ÖNORM B2506-3** [1)]
- Optimised filter material quantity (height: 300 mm)
- Highest cleaning performance class
- Homogeneous material, no separation during use
- Eliminates risk of remobilising heavy metals caused by surface water containing de-icing salts

3 Trapezoid-shaped, stainless steel perforated sheet metal.

- Separates the filter substrate zone from the drainage area, keeping the transverse drainage section permanently clear
- Optimised perforated surface for maximum water flow

4 Integrated control & water sampling shaft.

- Control/ water abstraction shaft for visual inspection and sampling
- Exceptionally easy to handle: Remove the grating and take the water sample
- Then remove the purified water and test for ingredients

5 Innovative DN 150 overflow for efficient stormwater drainage.

- Effective protection even in the most extreme rainfall
- Technical filter for cleaning the polluted first flush
- Controlled drainage of unpolluted excess water through the overflow pipe
- ATTENTION! Approval of the authority must be given for this device.

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[1)] The BG-FILCOTEN® green water treatment system is equipped and sold exclusively with ÖNORM B 2506-3 tested filter material. BG-Graspointner GmbH reserves the right to replace the advertised Mall "ViaClean plus" filter material, Test Number N 001970, with a comparable, ÖNORM B 2506-3 certified product where appropriate.

Connection surfaces per running metre				
	Nominal width	Filter surface	No overflow	With overflow [2]
BG-AQUA BGZ-S green	NW 300	0.27 m²	0.7 l/s	1.1 l/s
BG-FILCOTEN® green	NW 400	0.39 m²	0.9 l/s	1.6 l/s

Sample calculation for determining channel run lengths NW 400:

Starting point:

- Rainfall = 400 l/s/Ha (1Ha = 10,000 m²)
- Surface area to be drained (concrete, without infiltration system = 500 m²
- For 500 m², at least 5m² filter surface is required (filter surface ratio 1:100)

Water volume at 500 m²:

$$\frac{\text{Rainfall [l/s/Ha]} \cdot \text{Surface area [m²]}}{\text{10,000 [m²/Ha]}} = \text{water volume [l/s]}$$

$$\frac{400 \cdot 500}{10{,}000} = 20.0 \text{ l/s}$$

Required channel run length:

$$\frac{\text{water volume [l/s]}}{\text{Filter capacity [l/s]}} = \text{channel run length [m]}$$

No overflow:

$$\frac{20}{0.9} = 22.\dot{2} \sim 23 \text{ m}$$

With overflow:

$$\frac{20}{1.6} = 12.5 \sim 13 \text{ m}$$

Reviewing the filter surface ratio:

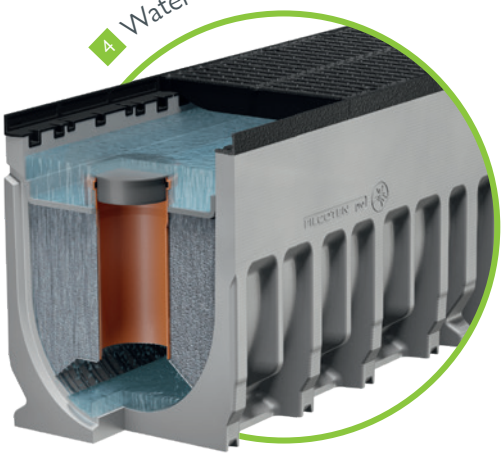
5 m² filter surface (1:100)

$$\frac{5}{0.39} = 12.8, \text{ i.e. 13 running metres of channel!}$$

System comparison: to drain 500 m², the following is required:

	No overflow:	with maximum overflow:
NW 300	29 m channel run	18.5 m channel run
NW 400	23 m channel run	13 m channel run

Our Technical Support will be pleased to provide a detailed calculation for your project: Phone: +43 6233/8900-0 | office@bg-graspointner.com



[2] *Max. filter surface ratio 1:100*

FILCOTEN® HPC:

Like conventional **concrete,**

only better.

The 100 % mineral high-performance concrete FILCOTEN® HPC is an enhanced form of traditional concrete. Its engineering and ecological propeties are achieved without the use of any styrenes, snythetic fibres or polymers. The optimised high-density structure of HPC makes it possible to construct highly stable lightweight drainage channels – but it's the idea behind it that makes it unique.

Minimal weight

- FILCOTEN® HPC enables lightweight construction
- Quick and easy to install
- Dimensionally stable, robust concrete elements

Perfect hold in the concrete bed

- Ideal expansion coefficient, identical to that of the surrounding concrete

High drainage performance

- Low water absorption and penetration
- Smooth channel surface for high drainage performance and optimal self-cleaning effect

Resistant to extreme temperatures and UV light

- Maximum resistance to frost and de-icing salt
- UV resistant

Fireproof

- Non-combustible building material – Class A1
- Therefore emits no toxic smoke

Maximum robustness

- Unsurpassed stability and durability
- High pressure resistance, clearly exceeding the requirements of EN 1433 for concrete channels

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Verified life cycle assessment (LCA)

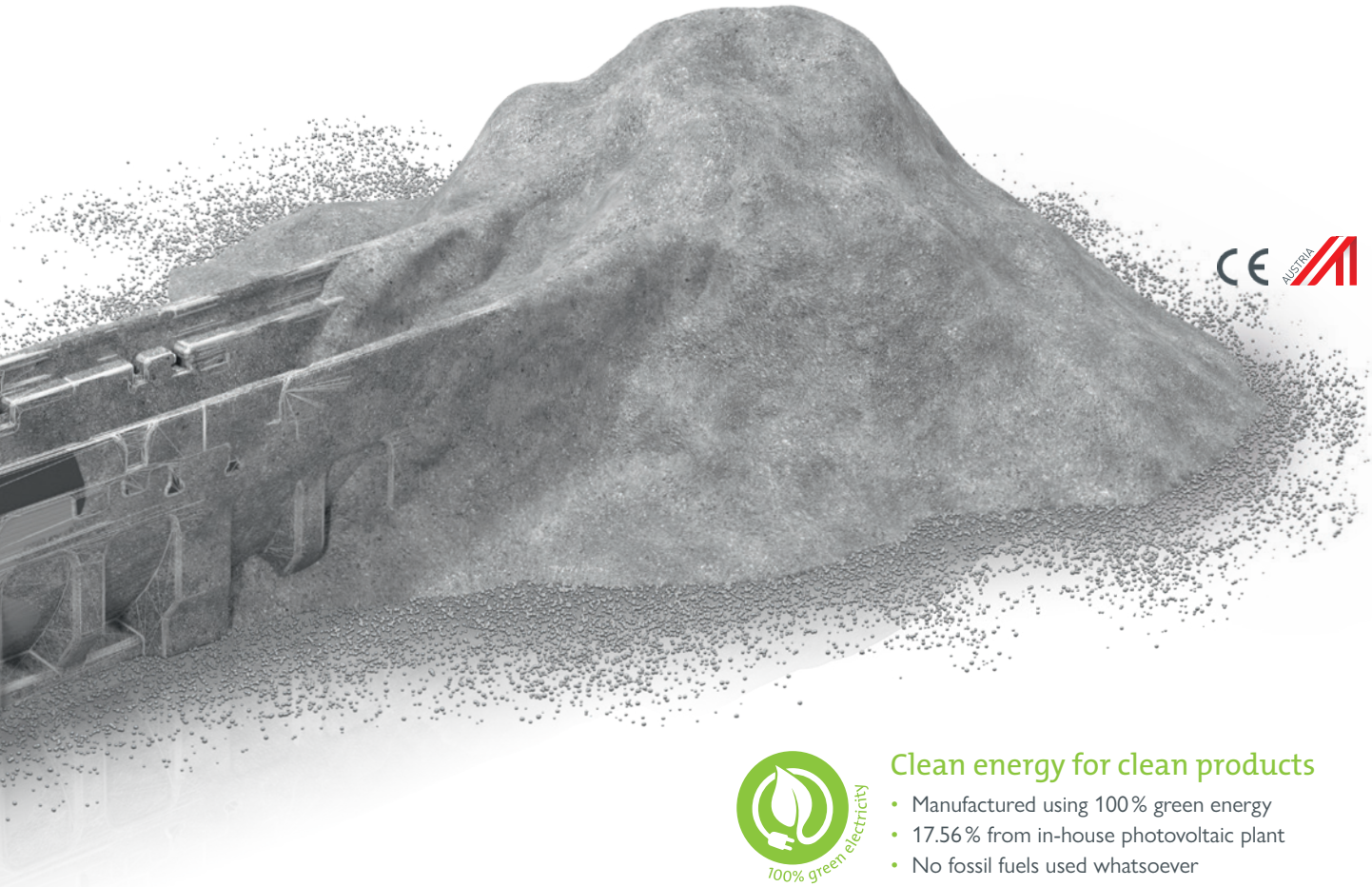
- Enhanced ecological transparency, in acc. with ISO 14040/14044 and EN 15804:A2
- Ideal for sustainable construction projects

Resource efficiency

- 100 % recyclable, certified
- Quality class U-A [3)]

Sustainable production

- Resource-efficient manufacturing process
- Up to 70 % [4)] less sand and gravel
- Up to 55 % [4)] less cement
- Up to 51 % [4)] less water



Clean energy for clean products

- Manufactured using 100 % green energy
- 17.56 % from in-house photovoltaic plant
- No fossil fuels used whatsoever

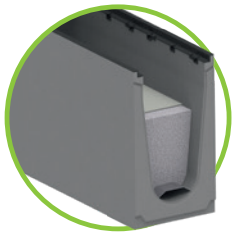
Certified for sustainability and tested for hazardous substances

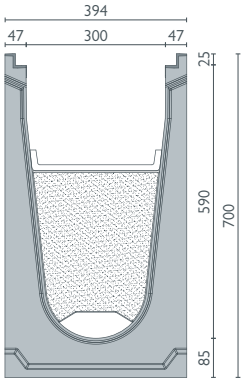
- Certified environmental and energy management to ISO 14001 or 50001 standards at the location in Oberwang/AT
- Certified biologically sound construction material that meets the stringent testing criteria of the IBR, the Institute for Biologically Sound Construction, for heavy metals, VOCs, biocides and radioactivity; styrene-free [1)]
- certified [2)] in acc. too KIWA BRL 5070

[1)] Free of synthetic resins. [2)] KIWA certificate no. NL BSB® K43940. [3)]Certified by the Salzburg Institute for Construction Engineering Research (bvfs)
[4)]Compared to a comparable product made of concrete.

up to class F 900

BG-AQUA BGZ-S green





BG-AQUA BGZ-S green, incl. cast iron edge, NW 300

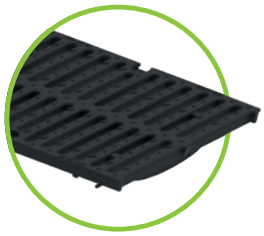
Drainage channel with cast-in ductile iron edge (G) up to class F, with boltable ductile iron gratings

Item no.	Channel body with ductile iron edge and safety joint	Slope	Weight	Pcs./Pallet
16846	BGZ-S green NW 300, CH = 700 mm, L = 2500 mm	0.0 %	671.0 kg	2
16847	BGZ-S green NW 300, CH = 700 mm, L = 1000 mm	0.0 %	269.0 kg	2
16844	BGZ-S green NW 301, CH = 700 mm, outlet DN 150, L = 2500 mm	0.0 %	662.0 kg	2
16845	BGZ-S green NW 301, CH = 700 mm, Outlet DN 150, L = 1000 mm	0.0 %	258.0 kg	2

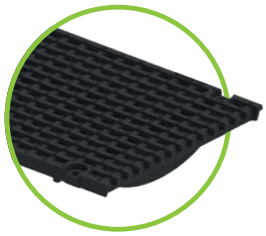
Gratings

For BG-AQUA BGZ-S green SV G with cast iron edge (G), NW 300

Item no.	Gratings incl. quick-locking system	Cl. acc. to EN 1433	Weight	Pcs./Pallet
23180	Ductile iron slotted grating 500/347/25, SW 18/150	D 400	15.2 kg	30
22784	Ductile iron elongated bar grating 500/347/25, MW 25/14	E 600	16.5 kg	30
Item no.	Gratings incl. 4 pcs. locking bolts	Cl. acc. to EN 1433	Weight	Pcs./Pallet
22785	Ductile iron elongated bar grating 500/347/25, MW 25/14	E 600	16.9 kg	30
22083	Ductile iron slotted grating 500/347/25, SW 16/148	F 900	26.1 kg	40



Ductile iron grating
SW 18/150
Class D – SV system



Ductile iron elongated bar grating MW 25/14
Class E – quick-locking system or 4 point boltable

Ductile iron grating
SW 16/148 – Class F
4 point boltable

Accessories

Installation parts for filter unit, front-/end caps

Item no.	Accessories	Material	Weight
19530959	green pre-filter mat, NW 300, L = 5000 mm, W = 400 mm		0.7 kg
19500919	Mall "ViaClean plus" filter material, **tested in acc. with Austrian standard B2506-3** [2)] Origin class A; surface ratio As: Ared from 1:150 Austrian Standards Certificate No.: N 001970		740.0 kg
19500920			629.0 kg
19500921			370.0 kg
19500922			185.0 kg
19030360	green trapezoid-shaped perforated sheet metal, NW 300, L = 2500 mm	stainless steel	3.5 kg
19030361	green trapezoid-shaped perforated sheet metal, NW 300, L = 1000 mm	stainless steel	2.5 kg
19530963	Water sampling shaft set, NW 300 consisting of: Trapezoid-shaped perforated sheet metal with outlet DN 150, L = 2000 mm, Pipe plug, bolting material	Stainless steel/PVC	1.4 kg
19530962	Overflow pipe set, NW 300 consisting of: Cover plate with outlet DN 150, L = 550 mm, Inlet cover, bolting material	Stainless steel/PVC	2.8 kg
19030353	green partition sheet NW 300	stainless steel	0.9 kg
22457	green front cap NW 300	stainless steel	3.0 kg
22458	green end cap with NW 300, DN 100 outlet	stainless steel	3.3 kg
19030501	green tool for substrate flattening NW 300	Wood	1.6 kg
31300	Sealant 1C – standard, concrete grey – Brand: Sikaflex Pro 3		600 ml/pouch
31302	Undercoat / primer – Brand: Sikaflex Primer 3N		250 ml/can
31206	Separation tape 9 x 2 mm		25 m/roll
31203	Applicator gun 450 ml – 600 ml		

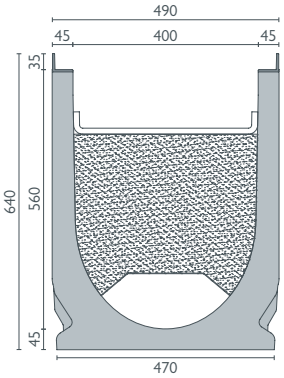
Joint sealing imperative! – see installation guidelines, starting on page 12.

BG-FILCOTEN® green

BG-FILCOTEN® green, incl. cast iron edge, NW 400

Drainage channel made of FILCOTEN® HPC (High Performance Concrete) with integrated ductile iron edge (G) up to class E

Item no.	Channel body with ductile iron edge and safety joint	Slope	Weight	Pcs./Pallet
10640166	green G NW 400, no. 30-0, CH = 650 mm, L= 2000 mm	0.0 %	356.0 kg	1
10641166	green G NW 400, no. 30-0, CH = 650 mm, L= 1000 mm	0.0 %	179.0 kg	1
10640176	green G NW 401, No. 30-0, CH = 640, outlet DN 200, L = 2000 mm	0.0 %	353.0 kg	1
10641176	green G NW 401, No. 30-0, CH = 640, Outlet DN 200, L = 1000 mm	0.0 %	176.0 kg	1



Gratings

for BG-FILCOTEN® green with ductile iron edge (G), NW 400

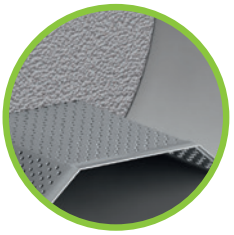
Item no.	Gratings 4 point boltable	Cl. acc. to EN 1433	Weight	Pcs./Pallet
17040181	green ductile iron slotted grating 500/474/35, SW 18/215 [1]	E 600	34.5 kg	20
32110	green locking device kit for ductile iron slotted grating (1 pc. bolt, 1 pc. nut – 8 pcs. required per m)			
32122	green locking device kit V2A for ductile iron slotted gratings (1 pc. bolt, 1 pc. nut – 8 pcs. required per m)			

Ductile iron grating, SW 18/215 – Cl. E 4 point boltable

Accessories

Installation parts for filter unit, front-/end caps

Item no.	Accessories	Material	Weight
19540910	green pre-filter mat, L = 5000 mm, W = 500 mm		0.9 kg
19500919	Mall "ViaClean plus" filter material, **tested in acc. with Austrian standard B2506-3** [2] Origin class A; surface ratio As: Ared from 1:150 Austrian Standards Certificate No.: N 001970		740.0 kg
19500920			629.0 kg
19500921			370.0 kg
19500922			185.0 kg
19040360	green trapezoid-shaped perforated sheet metal, NW 400, L = 2000 mm	stainless steel	5.0 kg
19040361	green trapezoid-shaped perforated sheet metal, NW 400, L = 1000 mm	stainless steel	2.5 kg
19540956	Water sampling shaft set, NW 400 consisting of: Trapezoid-shaped perforated sheet metal with outlet DN 150, L = 2000 mm, Pipe plug, bolting material	Stainless steel/PVC	6.6 kg
19540954	Overflow pipe set, NW 400 consisting of: Trapezoid-shaped perforated sheet metal with outlet DN 150, L = 2000 mm, Inlet cover, bolting material	Stainless steel/PVC	7.4 kg
19040353	green partition sheet NW 400	stainless steel	1.9 kg
19040350	green front cap NW 400	stainless steel	4.7 kg
19040351	green end cap with NW 400, DN 150 outlet	stainless steel	5.6 kg
19040500	green tool for substrate flattening NW 400	Wood	1.2 kg
31300	Sealant 1C – standard, concrete grey – Brand: Sikaflex Pro 3		600 ml/pouch
31302	Undercoat / primer – Brand: Sikaflex Primer 3N		250 ml/can
31206	Separation tape 9 x 2 mm		25 m/roll
31203	Applicator gun 450 ml – 600 ml		



green trapezoid-shaped perforated sheet metal, stainless steel

Joint sealing imperative! – see installation guidelines page 12.

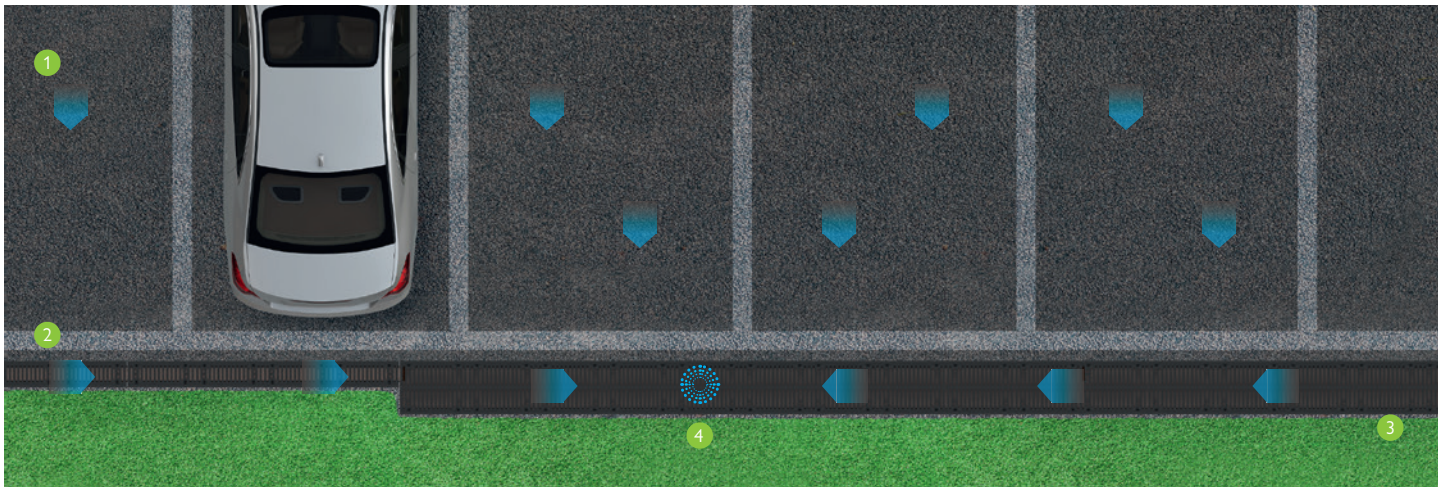
[1] *Locking device kit to be ordered separately.*

[2] *The BG-FILCOTEN® green water treatment system is equipped and sold exclusively with ÖNORM B 2506-3 tested filter material. BG-Graspointner GmbH reserves the right to replace the advertised Mall "ViaClean plus" filter material, Test Number N 001970, with a comparable, ÖNORM B 2506-3 certified product where appropriate.*

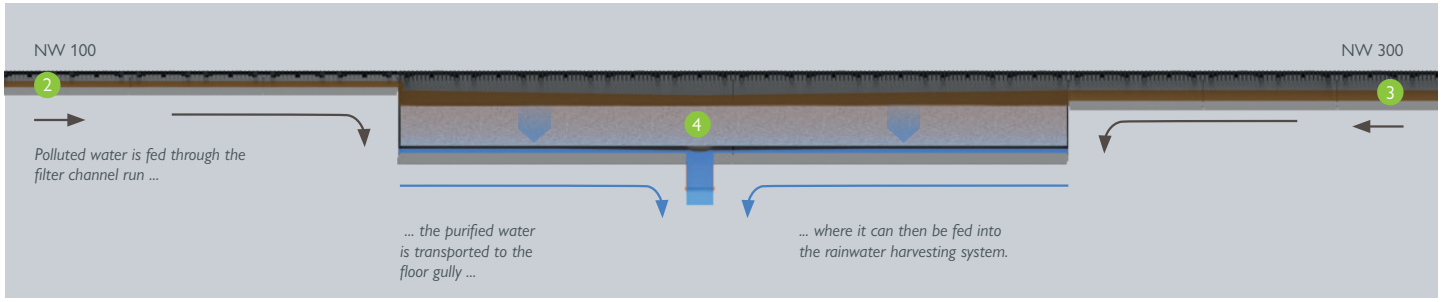
Perfectly planned, clean and cost-efficient.

Should a project necessitate a structurally longer channel run than that required by the length of the calculated filter channel run, a basic drainage channel can be used for the extension. This represents a far more cost-efficient solution for your project, without compromising the safety and cleaning performance aspects.

Inflow solution for a structurally longer channel run



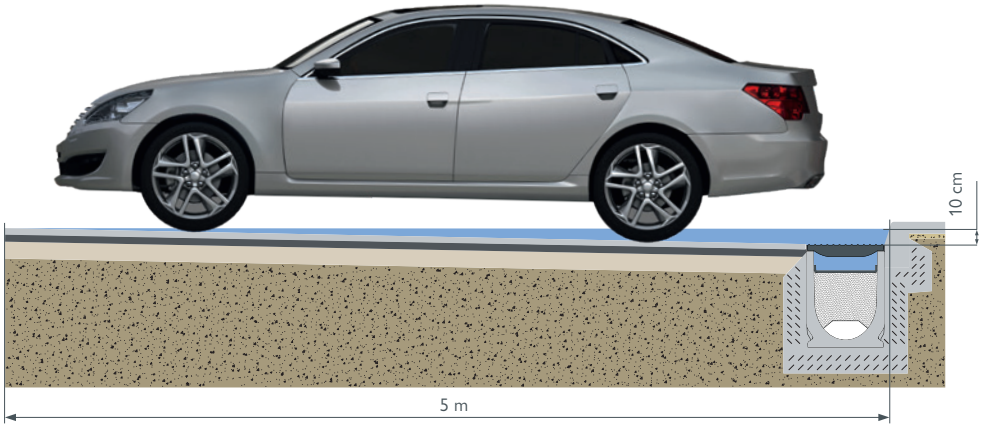
Cross-section of the channel run



1. The polluted rainwater flows across the car park towards the drainage channel system.
2. Cost-efficient inflow solution using a BG-CLASSIC BGZ-S NW 100 channel. The water is collected here and fed into the filter channel system.
3. Inflow via a low-height BG-CLASSIC BGZ-S NW 300. Benefit: same width – uniform appearance.
4. The BG-AQUA BGZ-S green system purifies and drains the water via the filter substrate.

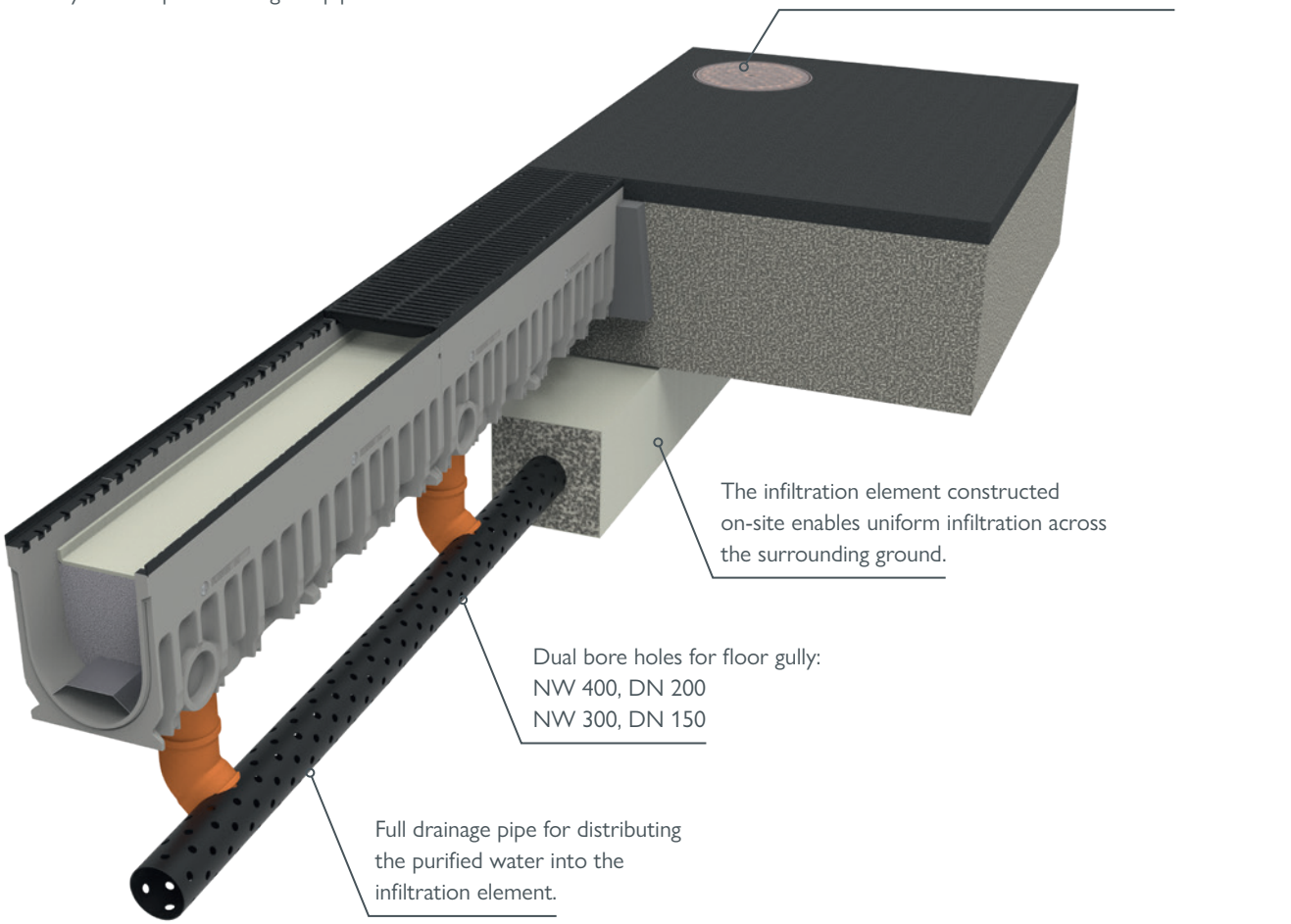
Optimised overflow planning

If planning for an overflow volume of approx. 0.25 m^3 per running metre, a significantly shorter channel run can be installed.



Sample solution for decentralised infiltration.

If using our non-perforated channels, the purified precipitation captured from traffic areas can be used individually or transported using KG pipes.



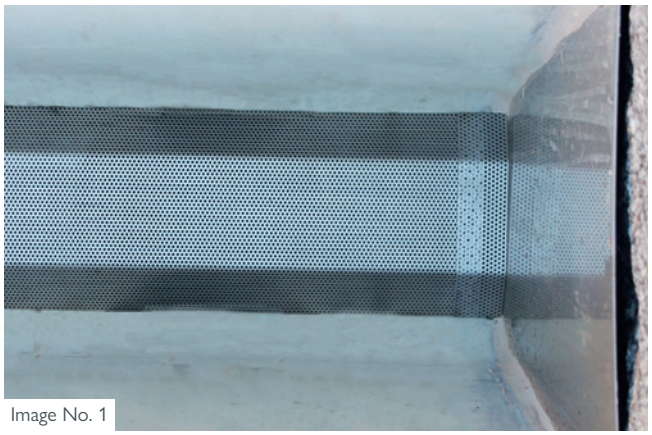


Image No. 1

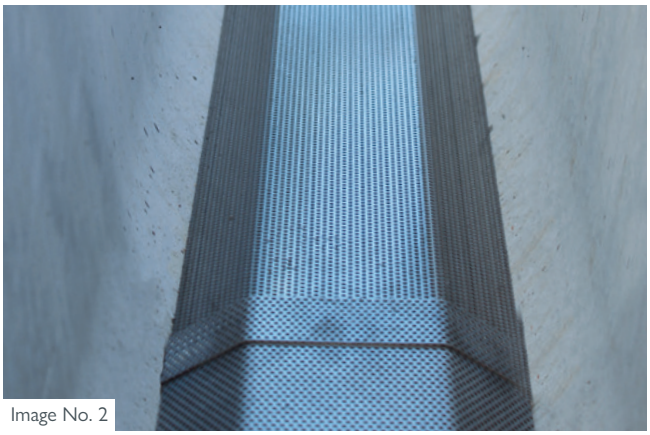


Image No. 2

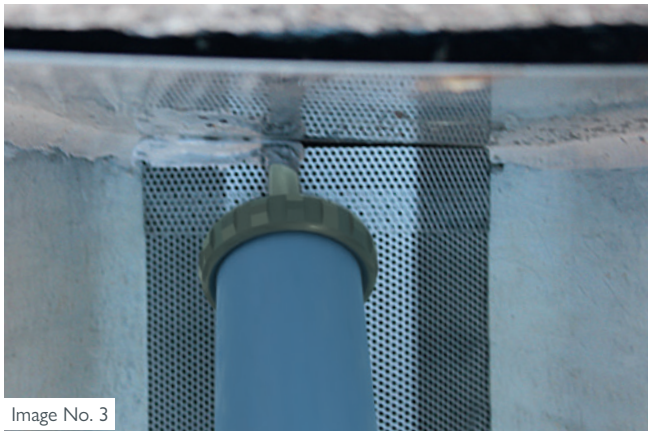


Image No. 3

Drainage channel installation guidelines

With an outlet into the sewage or infiltration system

The following installation guidelines and installation examples are intended for standard applications. The load class and the installation location in acc. with the EN 1433 standard will need to be adapted to the local conditions by the planner. The generally recognised technical rules and regulations must be observed during installation.

Connection to sewage pipes:
BG concrete channels must be aligned on a concrete foundation in line with the Austrian standard EN 206-1 or in microfine concrete in line with RVS 08.18.01. Depending on the static requirements, a lateral support wedge may be required. See installation details or contact BG Application Engineering. The channel elements should always be installed using suitable tools (e.g. BG lifting grab).

Infiltration beneath the channel:

1. The layers of the floor beneath the channel must meet the infiltration requirements. The BG concrete channels are installed on a correspondingly dimensioned gravel bed in a concrete foundation in accordance with Austrian standard EN 206-1, or in microfine concrete according to RVS 08.18.01. The outlet opening must be exposed (e.g. using Polokal pipe DN 150). Depending on the static requirements, a lateral support wedge may be required. See installation details or contact BG Application Engineering. The channel elements should always be installed using suitable tools (e.g. BG lifting grab).

2. Begin by laying the channel runs from the junction to the outlet. The flow direction on each channel is indicated with an arrow.

3. The butt joints between the channel bodies must be sealed or cemented using appropriate sealing compounds – for description of material and quantity calculation, see BG sealing system.

4. Before making the adjacent cover layer, ensure that the gratings are inserted and if necessary fixed, or the channels are braced adequately against compression. Avoid damaging the channels while compacting the superstructure and the pavement (asphalt, pavement, concrete, etc.).

5. Where horizontal forces (e.g. concrete surfaces, slopes, etc.) occur, a sufficiently sized running joint will need to be constructed in the vicinity of the carriageway edge and spaced between 30 – 200 cm from the channel. In the adjacent concrete surfaces, expansion joints which cross the channel run must be positioned so that they run through a channel joint.

6. To prevent uncontrolled stress cracks in a concrete stretcher along a channel run, preformed crack and/or expansion joints must be added at regular intervals, in accordance with recognised technical rules or as specified in a static calculation. These joints should be added at right angles (along the channel section) to the channel element joints. The number of joints and their spacing also depend, for example, on the concrete quality used as well as the ambient temperatures that exist when pouring the concrete, and also on the concrete curing, and should be carried out accordingly.

7. When shear forces occur, pavements must be force-locked to the backrest. This can be done by setting the first three rows of paving (along the channel run) in a mortar bed. The joints must be backfilled with mineral materials. Shear forces from the paving must not act directly on the channel walls (e.g. thermal expansion, braking forces, etc.). The respective technical guidelines for the creation of paved surfaces, in bound or unbound construction, must be observed accordingly.

8. The gratings must be secured with bolting-material (max. tightening torque of 40 Nm).

9. All adjacent cover layers should always be installed 3 – 5 mm above the upper surface of the channel in order to avoid mechanical damage (e.g. through snow removal) and ensure that water can drain off.

Image No. 4

Image No. 5

Filter unit installation guidelines

Technical filter

1. Once the BG-FILCOTEN® green channels have been correctly installed (see previous sections), the trapezoid-shaped perforated plate is inserted (Image 1). The protruding end of the trapezoid-shaped perforated sheet (transfer) must be butt-joined with the front side (end plate of the channel). Then, the next sheet with the transfer is placed on the first plate – care must be taken to ensure that they overlap correctly (Image 2).

2. Then, seal the trapezoid-shaped perforated sheet to the front-end plate (Image 3).

3. Empty the filter material in the "big bags" into the channel. A resealable filling hose is located on the bottom of the "big bag" (Image 4).

4. The correct height, i.e. the correct filter thickness of 30 cm, can be achieved (Image 5) by using the tool supplied to smooth the filter material.

5. Place the prefilter mat on the filter material with the denser side facing down (marked with a "U") and pull it up on the side walls (Image 6).

6. The ductile iron grating inserts into the channels and is 4-point bolted (Image 7).

Image No. 6

Image No. 7

Cleaning & maintenance guidelines

The filter capacity and the retention of material can only be ensured in the long-term if the system is maintained according to the following guidelines.

The drainage system must undergo **a visual inspection after every period of heavy rainfall, or at least every six months.** If the prefilter mat is heavily soiled, to the point where there is overflow in the channels, we recommend that you replace it or, if necessary, clean as follows:

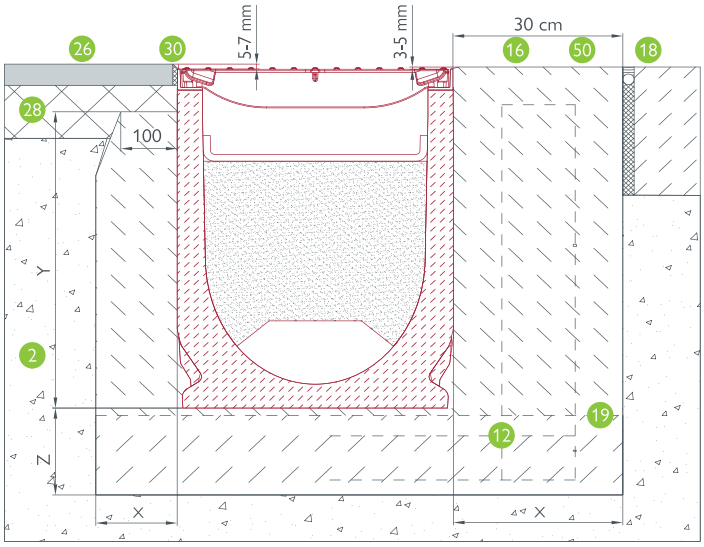
- Close off the work area in accordance with the applicable safety regulations.
- Remove the covering from the channels and place to one side.
- Begin by removing the prefilter mat from one side and collect the dirt in a suitable container (shake out, beat, rinse off by placing it in water against the direction of flow, …), then dispose of the residue correctly and in line with regulations.
- If the prefilter mats are extremely silted, we recommend replacing them – request replacements from BG-Graspointner.
- The thickness of the filter material can be checked using the flattening device.
- If the filter thickness is low, it will need to be filled up with new filter material up to the correct thickness.
- Place the cleaned prefilter mat on the filter material with the "U" side facing down and pull it up by the sides.
- When re-assembling the gratings, care must be taken to ensure that the gratings and edges are unsoiled so that they rest on the entire surface of the edges.
- Insert the gratings and bolt in place.

Water sample & filter material test

A water sample must be taken or a filter material test performed by the operator of the water treatment system at regular intervals and in accordance with the official requirements (water regulations).

If replacements are required, only original BG-Graspointner filter material must be used. This must be handled and inserted according to the installation instructions, as amended from time to time.

The removed filter material must be disposed of by a specialist company – e.g. sewer cleaning service – in accordance with the applicable legal guidelines.



Key

- 2 Load-bearing gravel layer
- 12 class E: Structural reinforcement
- 16 Concrete road surface
- 18 expansion joint
- 19 working joint
- 26 Surface course
- 28 bitumen layer
- 30 bituminous sealing tape
- 50 Transversal-concealed joint every 6 m along the channel joints, mature. Structural reinforcement and/or based on statics

Load class	B 125 kN	C 250 kN	D 400 kN	E 600 kN
Concrete quality acc. to EN 206-1*	C 20/25	C 20/25	C 25/30	C 25/30
Width: X	≥ 10 cm	≥ 15 cm	≥ 30 cm	≥ 30 cm
Height: Y	Channel height - 5 cm		Channel construction height	
Thickness: Z	≥ 10 cm	≥ 15 cm	≥ 20 cm	≥ 20 cm
Reinforcement	Not required			Acc. to static calc.

* Concrete quality is a minimum requirement and must be adapted to the local conditions.

CAUTION: Acceleration, braking and torque forces must be taken into consideration in each case. Follow the installation instructions. Technical specifications are subject to change. The installation drawings are general examples. Details and further information can be found on our website at www.bg-graspointner.com. For deviating installation scenarios, please contact our application engineers directly. Legal provisions arising from the water authority approval must be observed by the operator.

Our technical support service will be pleased to assist you and to provide you with a hydraulic calculation at any time:
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