

THE HAURATON DESIGNER PACKAGE

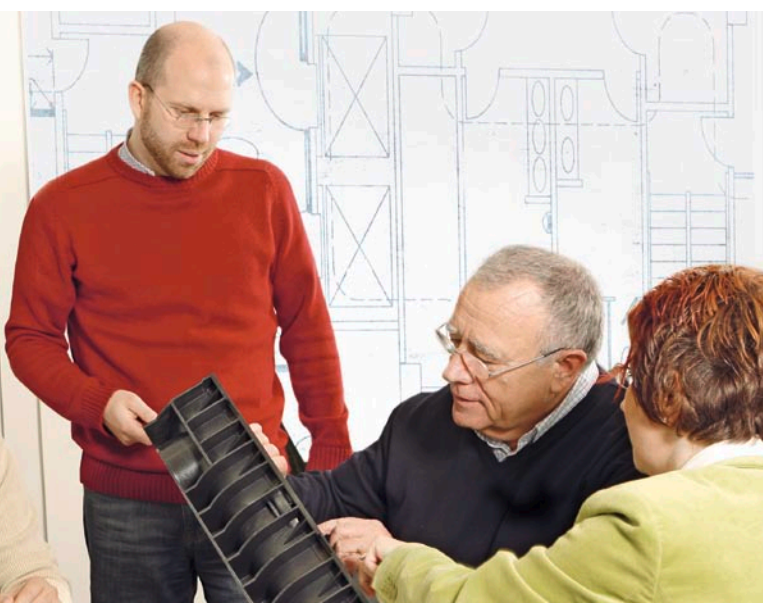
HAURATON IS NOT ONLY INVOLVED IN THE DEVELOPMENT OF INNOVATIVE PRODUCTS, THE COMPANY WILL ALSO SUPPORT YOU IN THE DESIGN AND IMPLEMENTATION OF YOUR PROJECTS.

INDIVIDUAL SUPPORT FOR THE SYSTEM DESIGNER

Designing solutions for the many and diverse requirements in the field of infiltration requires detailed knowledge, great expertise and extensive experience. Our experts, both in field sales as well as in the office, are fully trained to answer technical and product-specific questions to be able to provide you with competent and individual advice. We will support your individual building project from project-related tender documents through to installation - even where the brief calls for unusual duties and design. Give us a call or send us an email! We are always available for you and look forward to solving your individual questions regarding infiltration solutions.

SYSTEM DESIGN

The functionality of an infiltration system depends largely on various conditions, such as the local precipitation data, the absorptive properties of the soil and the computation of catchment areas. In order to make it easier for you to make an informed decision about the type, size and installation of the infiltration systems, we produce calculations for your specific site. Our calculations are free of charge and are based on DWA-A 138. All we need from you for the staff in our specialist department is some detailed information which you can enter in the calculation sheet for our DRAINFIX products. These parameters will be entered into the calculations. If you wish to make use of our service, please do not hesitate to contact our experts in-house and in field sales.



Cross Section DRAINFIX BLOC (1200x800)

M 1: 20

Geotextile GRK 3

Ventilation through inlet shaft

OUR ADVANTAGES FOR DESIGNERS

- ✓ Highly reliable design solutions based on products and processes with in-house and external quality monitoring
- ✓ Individual support for your designs
- ✓ Service free of charge: calculations for determining the size of the infiltration structure, project-specific specification texts and installation advice

HAURATON IS A MEMBER OF THE RAL QUALITY ASSOCIATION FOR WATER SYSTEMS E.V.

RAL (German Institute for Quality Assurance and Certification e.V.) is an organisation in charge of securing high quality levels of products and services. Only RAL, the head organisation of currently 131 quality organisations, is authorised to award quality marks in Germany.

HAURATON is a member of this quality association and can therefore offer the highest level of product certification.

DRAINFIX CALCULATION SHEET

Each HAURATON designer folder contains a DRAINFIX calculation sheet to be used by the system designer to enter all required data for calculating the volume and size of infiltration facility. On the basis of these data, HAURATON will provide free-of-charge calculations based on DWA-A 138.

DRAINFIX BERECHNUNGSBOGEN
ZUR DIMENSIONIERUNG ERFORDERLICHE ANGABEN
RÜCKFAX BITTE AN
+49 7222 958-101 oder -102 oder -147

hauraton

FIRMENNAME + ADRESSE _____

OBJEKTNAME + ORT _____

1. DIMENSIONIERUNG / ANGEBOT _____

2. ART DER EINZUGSGEBIETSFLÄCHE _____

☐ Dimensionierung ☐ Dimensionierung und Angebot

Dachfläche / Material Dachdeckung

☐ Schrägdach _____ m²

☐ Flachdach (Neigung bis 3° oder ca. 5 %) _____ m²

☐ Gründach (Neigung bis 15° oder ca. 25 %) _____ m²

Straßen, Wege und Plätze

☐ Asphalt, fugenloser Beton _____ m²

☐ Pflaster mit dichten Fugen _____ m²

☐ fester Kiesbelag _____ m²

☐ Pflaster mit offenen Fugen _____ m²

☐ lockerer Kiesbelag, Schotterrasen _____ m²

☐ Verbundsteine mit Fugen, Sickersteine _____ m²

☐ Rasengittersteine _____ m²

3. BODENBESCHAFFENHEIT (α₀-WERT) _____

☐ Sand ☐ schluffiger Sand _____ m/s

☐ sandiger Lehm ☐ Lehm _____ m/s

☐ Oberboden oder: k₀-Wert (m/s) _____ m/s

4. BELASTUNGSKLASSE
DRAINFIX-Einbauvarianten:

☐ begehbar ☐ BLOC ☐ TWIN 1 ☐ TWIN ☐ TWIN WAVE

☐ Pkw-befahrbar ☐ SLW 60

5. GEPLANTE RIGOLENABMESSUNG _____

6. GEWÜNSCHTE SYSTEMART _____

Länge/Breite/Höhe _____

☐ Rigole ☐ Regenrückhaltung einfach nach DWA-A 137

☐ Mulden-Rigole

7. MULDENBREITE / VERSICKERUNGSLÄCHE MULDE _____

b = _____ m A = _____ m²

8. AUSFÜHRUNGSZEITRAUM _____

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DESIGN PRINCIPLES FOR INFILTRATION STRUCTURES

THE DIMENSIONS OF AN INFILTRATION STRUCTURE DEPEND ON
A NUMBER OF ESSENTIAL PARAMETERS.

WHY INFILTRATION?

The continuing sealing off of surfaces through the construction of residential and commercial buildings and roads seriously affects the natural water cycle. In urban areas with average densities only about one quarter of the stormwater volume can infiltrate the ground. The largest part has to be drained away via the drainage systems. Defunct and inadequately sized drainage networks are no longer capable of handling these quantities of water. Natural soils and layers of vegetation provide storage for the stormwater and then release it again to the ground water with a time delay after it has been filtered.

As surfaces are sealed on construction sites, this process can no longer take place on an adequate scale. The result is the reduction of groundwater level and soils drying out. Another negative effect is the increasing risk of flooding catastrophes as well as the continuing need to construct costly drainage networks and retention basins. In order to counteract these developments we require systems that store stormwater at the place of precipitation and then release it gradually back into the natural cycle.

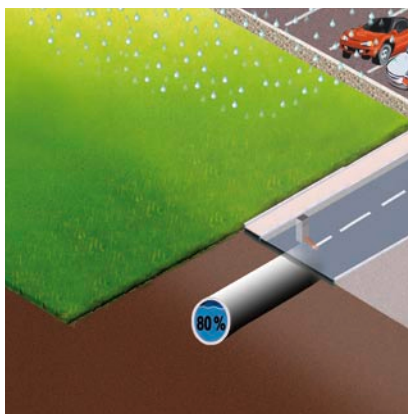


Figure 1: Original condition of site. Rainwater can soak away into the open soil. Utilisation of drains max. 80 %.

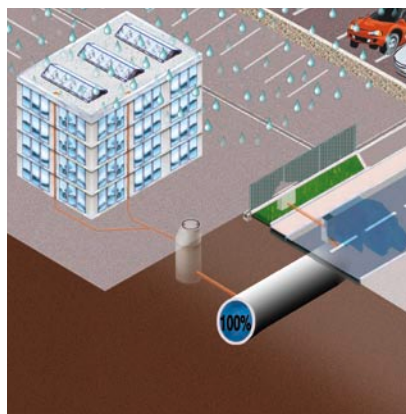


Figure 2: Buildings are erected on the site, the surface is sealed off. Precipitation water can no longer infiltrate the soil and is fully drained into the drainage system. This leads to an overload on the drainage system and hence to high costs for repair and upgrading.

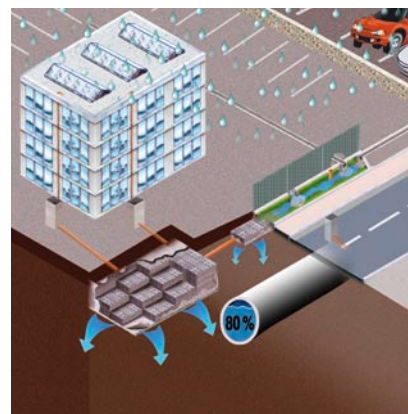


Figure 3: Decentralised infiltration via soak-away structure with infiltration blocks: precipitation water runs into the infiltration structure via channels or pipe drainage or directly from surfaces with infiltration capacity, such as turf. Advantages: less surface area required, less load on the drainage network, the surfaces above the infiltration structure remain usable.

COMMERCIAL REASONS

Constant upgrading work as well as the operation and maintenance of drainage networks and retention basins drives up the costs for local authorities. The effect this has on sewage charges is something we can all feel in our pockets. Many municipalities recommend and support with grants the construction of decentralised infiltration systems on building sites when areas are opened up for new developments. This ecological commitment can also bring financial benefits from grants or reduced levies and charges.

ADVANTAGES COMPARED TO CONVENTIONAL GRAVEL INFILTRATION STRUCTURES

- lightweight
- compact dimensions
- very high storage volume

Today many infiltration systems are built in the form of swales. However, these need a lot of space and are not very popular with nearby residents so that this solution is not very suitable for residential and commercial areas. A more compact version are infiltration structures underground, consisting of beds of gravel surrounded with geotextiles. The main disadvantage of these systems is the relatively small storage volume because only 30% of the overall volume is available for the storage of water. It follows therefore that in order to achieve the same capacity as an infiltration structure based on the DRAINFIX BLOC system, one has to excavate 3 times the amount of soil.

COMPLETE SYSTEM PROVIDER

Each infiltration structure has to meet a specific set of parameters and has to be adapted to the conditions on site. A range of different infiltration systems is available, which can be extended by additional components (e.g. sedimentation systems or manholes), depending on requirements. At HAURATON you will get everything you need from one port of call. Our service covers expert advice through to help with sizing and finally helpful tips for installing and operating the system. Likewise, you will get all the parts you need for the system from one supplier. Our product range includes several sedimentation systems, infiltration structures and manholes as well as the complete range of accessories. Design and build your infiltration system with HAURATON.



ADVANTAGE 1: LESS SOIL TO EXCAVATE

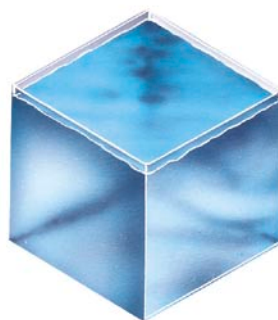


Excavated soil
DRAINFIX BLOC or
DRAINFIX TWIN

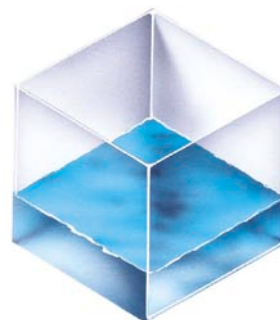


Excavated soil for
conventional gravel

ADVANTAGE 2: LARGER WATER STORAGE VOLUME



Volume of water stored
with **DRAINFIX BLOC**
or **DRAINFIX TWIN**



Volume of water stored
in conventional gravel

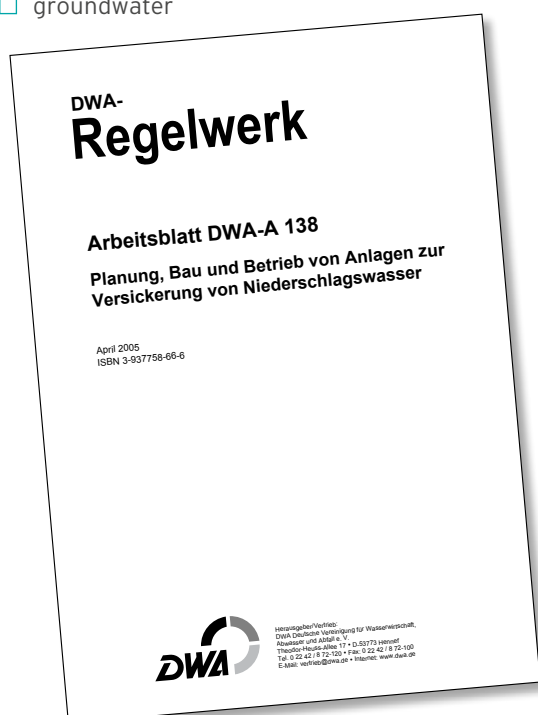
DESIGN PRINCIPLES FOR INFILTRATION STRUCTURES

THE DIMENSIONS OF AN INFILTRATION STRUCTURE DEPEND ON
A NUMBER OF ESSENTIAL PARAMETERS.

SIZING IN ACCORDANCE WITH DWA-A 138

The regulations issued by the Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall e.V., (German association for water and wastewater management and refuse), abbreviated DWA, in Germany are considered the generally accepted basis for the design, construction and operation of water, wastewater and waste management systems as well as the protection of the soil. Infiltration structures are covered in worksheet DWA-A 138. According to that, the following parameters need to be taken into consideration for sizing an infiltration structure:

- ☐ catchment area and run-off factor
- ☐ soil conditions and permeability, k_f -value
- ☐ rain yield and occurrence of rain
- ☐ groundwater



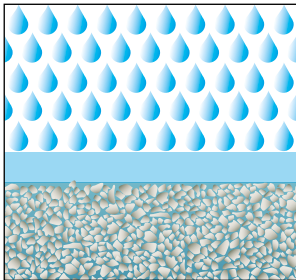
CATCHMENT AREAS

This includes all areas from which precipitation water runs into the infiltration system. The important parameters are the degree of water permeability (run-off value) and planned usage. For example, the water coming off an area of turf is different in quantity and quality to that coming off a road.

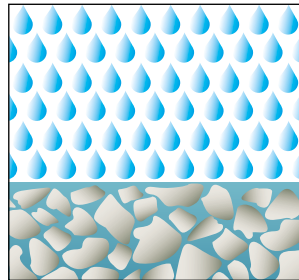
TYPE OF SURFACE	SUGGESTED MEAN RUN-OFF VALUES ψ_m FOR TYPE OF SURFACE FINISH
Sloping roof	metal, glass, slate, fibre cement: 0.9 – 1.0
	tiles, roofing felt: 0.8 – 1.0
Flat roof (slope up to 3° or approx. 5%)	metal, glass, fibre cement: 0.9 – 1.0
	roofing felt: 0.9
	gravel: 0.7
Green roof (slope up to 15° or approx. 25%)	with ← 10 cm humus layer: 0.5
	with → 10 cm humus layer: 0.3
Roads, pathways and squares (level)	asphalt, concrete without joints: 0.9
	paving with closed joints: 0.75
	firm gravel topping: 0.6
	paving with open joints: 0.5
	loose gravel topping, turf on broken stone: 0.3
	interlocking pavers with joints, draining pavers: 0.25
	turf pavers: 0.15
Banks, hard shoulders and ditches	clayey soil: 0.5
	loamy sand soil: 0.4
	gravel and sand soil: 0.3
Gardens, meadows and agricultural land	level terrain: 0.0 – 0.1
	sloping terrain: 0.1 – 0.3

SOIL PROPERTIES, k_f -VALUE

The properties of the soils are of critical importance for the infiltration characteristics. Sandy soils or those with a gravel content have a lower infiltration factor k_f and hence allow significantly more infiltration than those with a high clay content. This k_f -value is determined by the grain size, composition and volume of the material in the soil and indicates how fast water can infiltrate (soak away). Soils with good infiltration characteristics have k_f -values between 10^{-3} m/s and 10^{-6} m/s and range from sandy gravel to sandy silt.



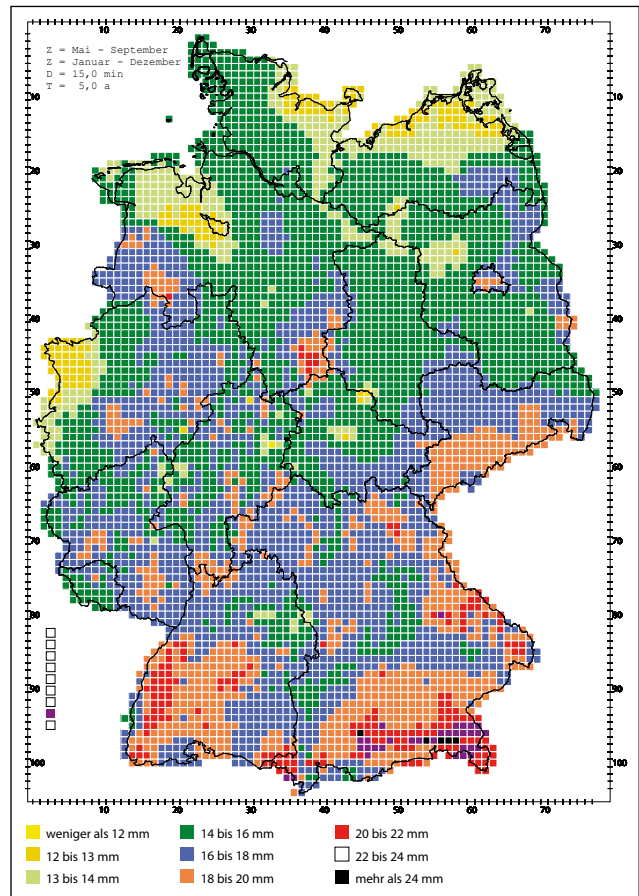
small grain size -
low permeability



big grain size -
high permeability

RAIN YIELD AND OCCURRENCE IN ACC. W. DWA-M 153 AND DWA-A 138

We will determine the rain yield for the location of your infiltration structure on the basis of the KOSTRA data, a long-term collection of data by the German Weather Service. These data list the quantity, duration and intervals of rain for every location in Germany. The calculation is based on the most unfavourable precipitation values, thus ensuring an adequate safety factor.



Map of Germany showing precipitation quantities
(in litres per second and hectare)

Depending on where it comes from, water can have more or less dirt particles and may carry fine dirt particles. Engineers can evaluate the properties of the precipitation water in accordance with worksheet DWA-M 153 and use these data for the calculations. Depending on the content of pollutants, worksheet DWA-A 138 distinguishes between harmless, tolerable and not tolerable water qualities. All these factors have to be taken into account when selecting and designing an infiltration system.

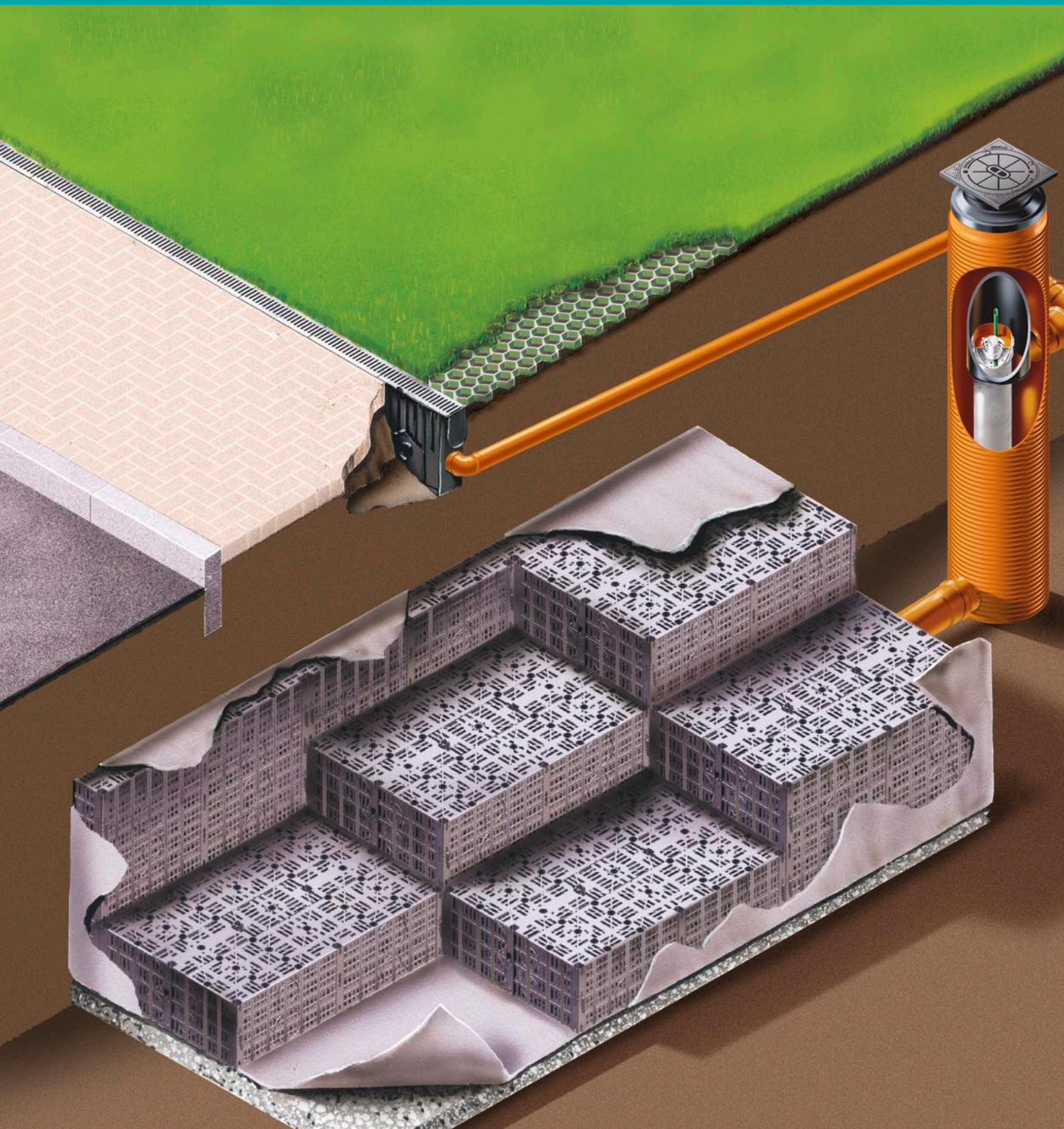
GROUNDWATER

One of the most important ecological reasons for the installation of infiltration systems is the protection of groundwater. With the help of these systems, precipitation water is returned to the natural cycle. An adequate distance (at least 1 m) has to be guaranteed permanently between the floor of the infiltration structure and the highest expected groundwater level. In addition, there must be no polluted layers of soil in the catchment area of the system. Otherwise, pollutants dissolved in water may get into the groundwater.

DRAINFIX® BLOC

STABLE, SAFE AND EXTREMELY STRONG.

INFILTRATION MODULES FOR INDUSTRIAL AND COMMERCIAL AREAS.



AT A GLANCE

- ✓ Infiltration block with very high storage capacity
- ✓ Light-weight and variable infiltration modules
- ✓ Requires only a minimum of excavation
- ✓ Ideal where space is restricted
- ✓ Load-bearing capacity up to SLW 60, suitable for installation under areas with vehicular traffic



DRAINFIX®BLOC

STABLE, SAFE AND EXTREMELY STRONG.

INFILTRATION MODULES FOR INDUSTRIAL AND COMMERCIAL AREAS.

THE PRODUCT

DRAINFIX BLOC is a polypropylene (PP) infiltration block with a very high storage capacity. The void ratio is more than 90%. The system can be installed in areas with different load requirements - even in HGV-trafficked areas up to SLW 60. The modules have been tested structurally for different load conditions. Stormwater enters the infiltration structure through infiltration in accordance with work sheet DWA-A 138. Filtered water will reach the system via an inlet and distribution SHAFT. This SHAFT has an additional small particle filter which is capable of retaining non-soluble residual dirt. The individual elements have compact dimensions and are connected to each other without accessories. In that way the infiltration structure is constructed up to the required calculated size. The SHAFT has an overflow facility connected to the drainage system. In addition, the SHAFT can be used to control the infiltration performance and/or the level of water in the infiltration trench and can be used to function as a control SHAFT.

APPLICATION AREAS

Decentralised infiltration solutions in commercial areas, industrial precincts and on private property, in particular underneath traffic areas, e.g. parking areas to class VI of RStO 01 and other areas with vehicular access, depending on local building regulations.

FURTHER ADVANTAGES

□ Unique connection technology without accessories

In order to achieve the required storage volume simply add several DRAINFIX BLOC elements together using the push-fit function. The individual modules will form a stable structure horizontally and vertically, without additional accessories. This connection method saves time and money. It has been developed by HAURATON and is unique in the market.

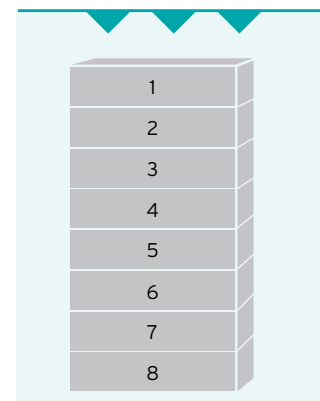
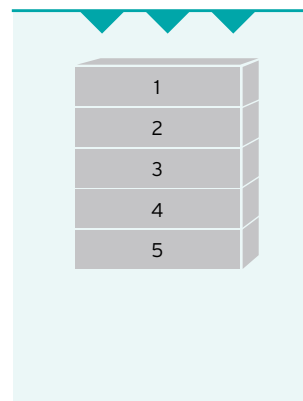
□ High load-bearing capacity

Any infiltration structures in commercial areas are exposed to heavy goods vehicle (HGV) traffic. For these applications and depending on the installation method we offer a DRAINFIX BLOC model for up to SLW 60. These products are therefore particularly suitable for installation underneath trafficked areas with HGV usage, e.g. fire engine access lanes.

SUITABLE FOR HGV, UP TO SLW 60



SUITABLE FOR PASSENGER CARS



More layers are possible depending on the object.



□ Very strong hence small space requirement

Depending on the type of soil, the modules can be installed in several layers. Under SLW 60 conditions it is possible to form 5 or more layers (depending on the type of soil and details of the cover); under less heavy loads it is possible to increase the number of layers as calculated for the respective loads, for example 8 layers for passenger car traffic. This minimises the size of the building site and the space requirement.

□ Change of use

Where there is a subsequent change of use, DRAINFIX BLOC offers another assurance. Any areas that were originally designed for pedestrian traffic only can also be reclassified for vehicular traffic given certain installation details.

□ Geotextile dressing to maintain function

The function of an infiltration structure will be restricted where dirt and soil particles silt up inside the structure. The build up of silt will reduce the amount of infiltration. To avoid this effect, the whole structure is wrapped up in a geotextile membrane made from PP-fleece GRK 3 (weight: 200g/m²). Stormwater will always be filtered when using infiltration structures and SHAFTs, which helps to prevent silting up.

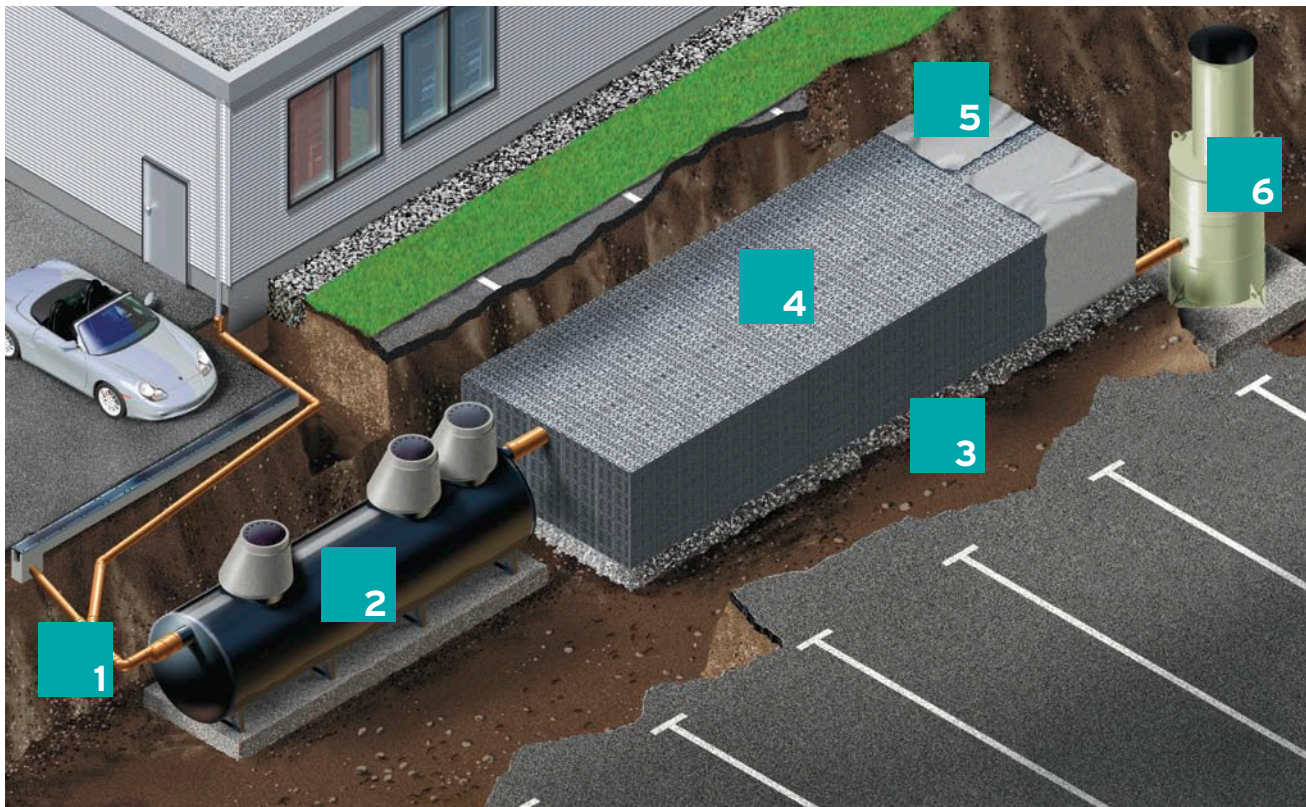


Taylor made solution according planners request

DRAINFIX® BLOC

STABLE, SAFE AND EXTREMELY STRONG.

INFILTRATION MODULES FOR INDUSTRIAL AND COMMERCIAL AREAS.



1

Water inlet pipe

Stormwater collection pipe channels water into the SHAFT

3

Road level

Granular subbase on ground with infiltration capability

5

Geotextile

Can be used to protect the infiltration trench from silting up (optional)

2

Rainwater treatment plant

Individual dimensioned plant to filter dirt particles

4

Infiltration element

DRAINFIX BLOC elements with high storage volume and even infiltration performance

6

Control shaft

To control, clean and maintain the infiltration trench

DRAINFIX® BLOC SHAFTS

LARGE VOLUMES FOR PROVABLE SAFETY.

THE INFILTRATION STORAGE FOR MAXIMUM LOADS IN COMMERCIAL AREAS.

COMPLETE SYSTEM WITH INLET AND OUTLET CHAMBERS

Water will flow into the infiltration structure via an inlet, filter and distribution chamber which can be used for several inlet pipes. The chamber features a serviceable filter pipe that cleans the water from any silt components before it enters the system. The multi-function outlet chamber fulfils several duties:

□ Outlet, emergency overflow

Where the quantities of water are very large, the infiltration structure may get completely filled up. To provide for that case, it is possible to connect an overflow which will allow excess water to run into another infiltration structure or into the drainage system.

□ Control mechanism

In the case of poor infiltration properties of the soil, as well as to provide additional security, it is possible to fit a commercially available dynamic or static control mechanism for retention and infiltration.

□ Venting

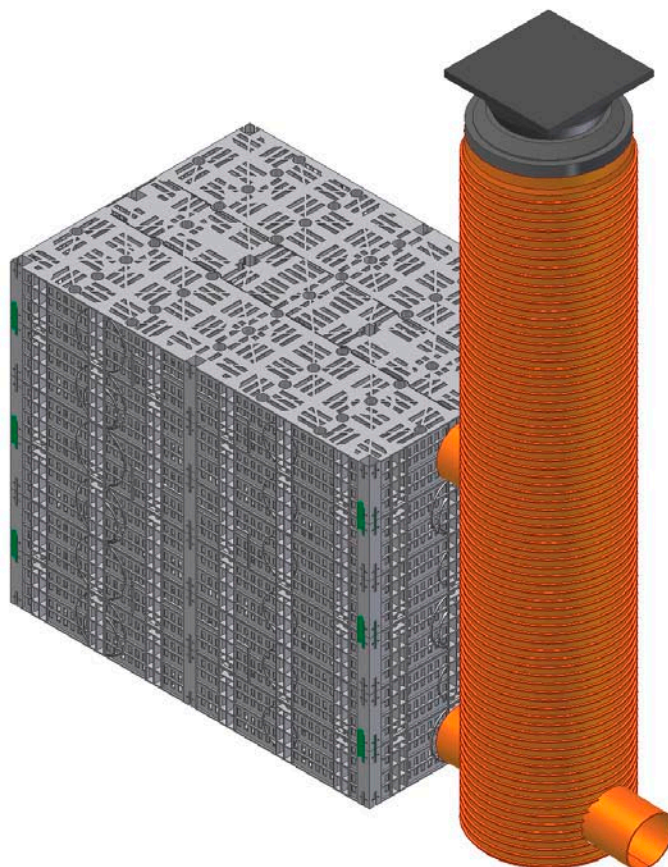
It is also necessary to allow air to escape from the system so that it can cope with a very sudden inflow of water. The chamber can also be used for the purpose of discharging air.

□ Control

Another important function of the chamber is the control of the infiltration performance and level within the infiltration structure. No other chamber is available in the market with such a broad spectrum of functionalities. The chamber is made of plastic and available in classes A 15, B 125 and D 400 to suit different requirements.

MULTI-FUNCTION SHAFT

- inlet
- emergency overflow
- venting
- outlet
- control mechanism
- control/monitoring



□ Pre-formed connections

DRAINFIX BLOC modules as well as all chambers have pipe connections for sizes DN 100/150. This allows for easy and quick connections to standard PVC pipes.



Shaft DN 1000



Further shaft dimensions we can offer after the individual dimensioning.



DRAINFIX®BLOC

MAXIMUM STRENGTH AND LONG-TERM DURABILITY ARE AN ESSENTIAL REQUIREMENT FOR INFILTRATION STRUCTURES BUILT WITH INFILTRATION BLOCKS. DRAINFIX BLOC MODULES HAVE BEEN SUBJECTED TO RIGOROUS TESTING. THE RESULT: DRAINFIX BLOC HAS BEEN PROVEN TO BE ONE OF THE STRONGEST SYSTEMS ON THE MARKET.

PROVEN TO BE ONE OF THE STRONGEST SYSTEMS ON THE MARKET

Proven quality and strength

- ☐ quality management system in accordance with DIN ISO 9001:2000
- ☐ suitable for load class SLW 60 according to calculations by civil engineer (VBI)
- ☐ calculations and product testing in accordance with strict BBA requirements (British Board of Agreement)
- ☐ proven long-term functionality (50 years) as tested under British standards

= maximum reliability for the system designer
= DRAINFIX BLOC

STRENGTH TESTED TO BBA REQUIREMENTS

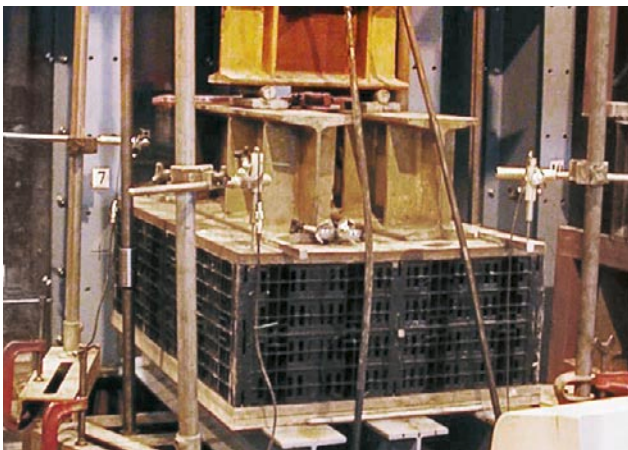
Test methods

The results are based on a number of structural tests:

- ☐ vertical and horizontal point loads applied via a 300 mm diameter steel plate
- ☐ vertical and horizontal distributed load applied via a steel plate covering the whole test specimen
- ☐ serial testing to assess creep characteristics. Test loads representing 80 %, 60 %, 40 % and 20 % of the maximum permissible point load were applied for a defined period of time (200 days).



Test with point load from above



Test with vertical distributed load



Test with horizontal load

RESULTS

Since March 2003, a standardised test method for plastic objects has been introduced in compliance with BBA regulations (British Board of Agreement).

- tests for maximum horizontal and vertical loading:

results:

distributed load

vertical compressive strength = 600 kN/m²

horizontal compressive strength = 120 kN/m²

point load

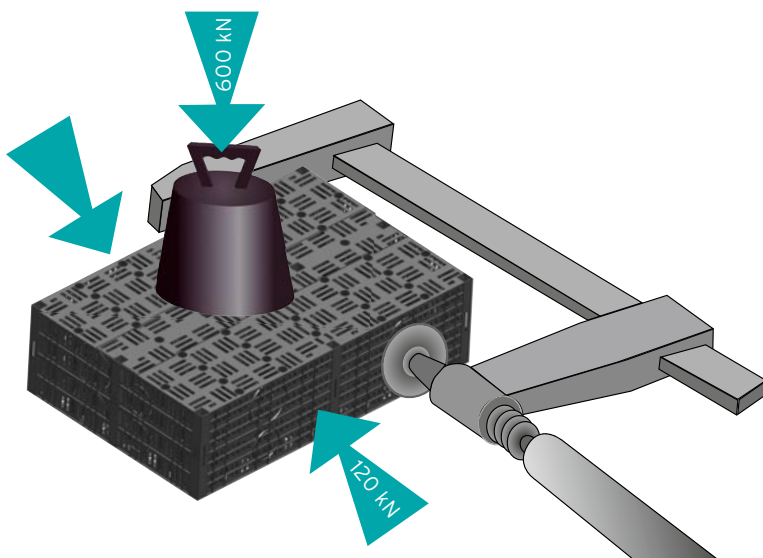
vertical compressive strength = 800 kN/m²

horizontal compressive strength = 120 kN/m²

- achievable installation depth up to 7.1 m depending on type of soil and load - without permanent supporting structures such as geolattice, sheet piling or concrete walls
- long-term test (up to 200 days) for assessing the creep characteristics - allows conclusions for a life span of up to 50 years
- the DRAINFIX BLOC by HAURATON also has been calculated under the German standard DIN1072 up to load class SLW60

DRAINFIX BLOC: strong system for maximum load-bearing capacity = maximum reliability for the system designer

DRAINFIX BLOC by HAURATON has been tested in accordance with the exacting English test methods.



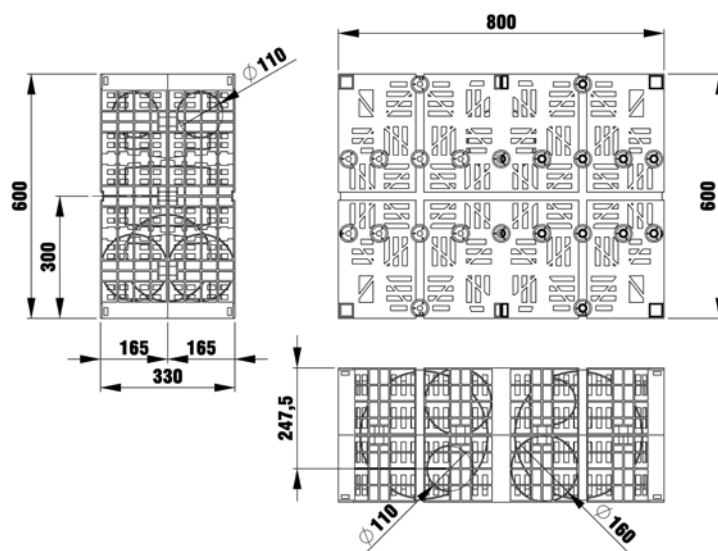
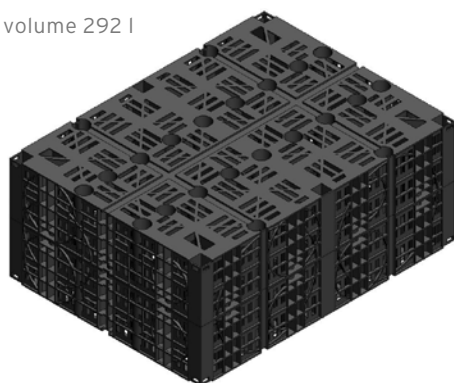
Dr. Niemann Consult INGENIEURGESELLSCHAFT MBH TRAGWERKPLANUNG im Anlagenbau		
STATISCHE BERECHNUNG für Hauraton RECYFIX-Drainbloc Oberflächen-Entwässerung Modul-Bauweise		
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The Environmental Protection Group The College Business Centre Ulswater New Road, Derby DE22 9WZ Telephone: 01332 346 516 Fax: 01332 346 519 Email: epg@epg.co.uk www.epg.co.uk Company Number: 3000162
Assessment of structural performance of Drainbloc stormwater storage system for Hauraton Revision 1.0 June 2004

DRAINFIX®BLOC

DRAINFIX®BLOC - Seepage element, SLW 60 depending on installation

Black, volume 292 l



	Length mm	Width mm	Height mm	Weight kg	Article No.
Size 1, Black, volume 146 l	600	800	330	-	96025
Size 2, Black, volume 292 l	1200	800	330	23,0	96000
Supplementary for access with camera (for Size 2)	1200	800	330	2,4	96150

DRAINFIX® - Rainwater treatment plants (ATV)

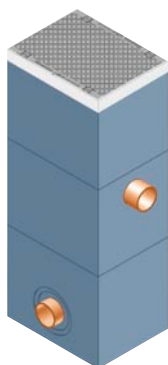
Type 20



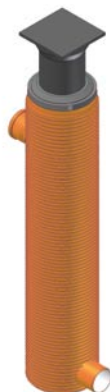
	Length mm	Width mm	Height mm	Weight kg	external diameter mm	Flow capacity l/s	Article No.
Type 20	6000	1500	1650	-	1500	20	96400
Type 50	9000	2500	2650	-	2500	50	96410
Type 100	17000	2500	2650	-	2500	100	96420

All DRAINFIX - Rainwater treatment plants (ATV) are also applicable for DRAINFIX TWIN.

DRAINFIX® - Multifunction shafts



Inlet and distribution shaft SUPER, 3-piece with closed ductile iron cover, black, class E 600



Filter shaft* 400/1500 with fine filter cartridge, with ductile iron grating, closed, class B 125



Discharge shaft DN 1000 with inlet and outlet DN 150

	Length mm	Width mm	Height mm	Weight kg	Article No.
Inlet and distribution shaft SUPER, 3-piece with closed ductile iron cover, black, class E 600	510	390	1250	289,0	96250
Multifunction discharge shaft SUPER, 3-piece, with closed ductile iron cover, black, class E 600	510	390	1250	284,0	96350
Filter shaft* 400/1500 with fine filter cartridge, with ductile iron grating, closed, class B 125	400	-	1673	-	96710
Filter shaft* 400/1500 with fine filter cartridge, with ductile iron grating, closed, class D 400	400	-	1673	-	96720
Filter shaft* 400/2000 with fine filter cartridge, with ductile iron grating, closed, class B 125	400	-	2173	-	96760
Filter shaft* 400/2000 with fine filter cartridge, with ductile iron grating, closed, class D 400	400	-	2173	-	96770
Multifunction shaft* 400/1500 with ductile iron grating, closed, class B 125	400	-	1673	-	96715
Multifunction shaft* 400/1500 with ductile iron grating, closed, class D 400	400	-	1673	-	96725
Multifunction shaft* 400/2000 with ductile iron grating, closed, class B 125	400	-	2173	-	96765
Multifunction shaft* 400/2000 with ductile iron grating, closed, class D 400	400	-	2173	-	96775
Discharge shaft DN 1000 with inlet and outlet DN 150	1000	-	2345	-	96890

* Height adjustable via telescope adaptation

DRAINFIX®BLOC - Accessories



Connection adaptor for DRAINFIX BLOC Size 1, red



Connection adaptor for DRAINFIX BLOC Size 2, green

	Length mm	Width mm	Height mm	Weight kg	Article No.
Connection adaptor for DRAINFIX BLOC Size 1, red	74	46	48	-	96115
Connection adaptor for DRAINFIX BLOC Size 2, green	35	35	100	-	96110
Geotextile from PP-fleece GRK3 rollware 2 x 200 m, 200 g/m ²	-	-	-	80,0	96120
Geotextile form PP-fleece GRK3, sold by 2 m ² per metre cutting-off of the the roll	-	-	-	0,2	96130

TENDER PROPOSALS

DRAINFIX BLOC INFILTRATION ELEMENTS

1. ____ no.

DRAINFIX BLOC

black, storage volume 292 l, made from PP; infiltration block, suitable for infiltration, retention and storage trenches and swales, with over 90 % storage capacity, with integrated connector adapters for safe positioning in accordance with DGBM, height 330 mm, length 1200 mm, width 800 mm, art. no. 96000. To be supplied and laid in accordance with the manufacturer's installation instructions. With suitable installation details load class up to SLW 60 - suitable for HGV. Quality in acc. with DIN EN ISO 9001:2000

Manufactured by: Hauraton GmbH & Co. KG
P. O. Box 16 61
D-76437 Rastatt, Germany
Tel.: +49-7222-958-0
Fax: +49-7222-958-102
E-Mail: export@hauraton.com

ACCESSORIES

2. ____ no.

DRAINFIX RAINWATER TREATMENT PLANT TYPE 20 ATVR

DN 1500 mm, length 6000 mm for 20 l/s, inlet in front of DRAINFIX ditch including filter element and sedimentation space; pipe connection possibility DN 300, art. no. 96400

3. ____ no.

DRAINFIX RAINWATER TREATMENT PLANT TYPE 20 ATVR

DN 2500 mm, length 9000 mm for 50 l/s, inlet in front of DRAINFIX ditch including filter element and sedimentation space; pipe connection possibility DN 300, art. no. 96410

4. ____ no.

DRAINFIX RAINWATER TREATMENT PLANT TYPE 100 ATV

DN 2500 mm, length 17000 mm for 100 l/s, inlet in front of DRAINFIX ditch including filter element and sedimentation space; pipe connection possibility DN 300, art. no. 96420

5. ____ no.

INLET AND DISTRIBUTION SHAFT SUPER

in 3 parts, made from fibre-reinforced concrete with galvanised steel frame, load class E 600 with SIDE-LOCK boltless quick-locking system, 4-fold locking and closed cast iron cover, consisting of top, middle part with filter element and base, h/w/l 1250 x 390 x 510 mm, art. no. 96250

6. ____ no.

MULTI-FUNCTION OUTLET SHAFT SUPER

in 3 parts, made from fibre-reinforced concrete with galvanised steel frame, load class E 600 with SIDE-LOCK boltless quick-locking system, 4-fold locking and closed cast iron cover, consisting of top, middle part with filter element and base, h/w/l 1250 x 390 x 510 mm, art. no. 96350

7. ____ no. **FILTER MANHOLE 400/1500**
made from PP, with closed cast iron cover, load class ____, nominal width 400, with telescopic adapter and integrated sludge trap and fine filter cartridge with inspection facility, including visual maintenance indicator, inlet and outlet spigot DN 150, height of manhole 1,673 mm, can be extended by up to 680 mm via telescopic function, art. no. ____
8. ____ no. **FILTER MANHOLE 400/2000**
made from PP, with closed cast iron cover, load class ____, nominal width 400, with telescopic adapter and integrated sludge trap and fine filter cartridge with inspection facility, including visual maintenance indicator, inlet and outlet spigot DN 150, height of manhole 2,173 mm, can be extended by up to 180 mm via telescopic function; art. no. ____
9. ____ no. **MULTI-FUNCTION CHAMBER 400/1500**
made from PP, with closed cast iron cover, load class ____, nominal width 400, with telescopic adapter, inlet and outlet spigot DN 150, height of manhole 1,673 mm, can be extended up to 680 mm via continuous telescopic extension, functions: outlet, emergency overflow, venting, control, art. no. ____
10. ____ no. **MULTI-FUNCTION CHAMBER 400/2000**
made from PP, with closed cast iron cover, load class ____, nominal width 400, with telescopic adapter, inlet and outlet spigot DN 150, height of manhole 2,173 mm, can be extended up to 680 mm via continuous telescopic extension, functions: outlet, emergency overflow, venting, control, art. no. ____
11. ____ no. **DRAINFIX OUTLET SHAFT DN 1000**
with pipe connection possibility inlet and outlet DN 150, inlet height 794 mm, Shaft height 2345 mm, art. no. 96890

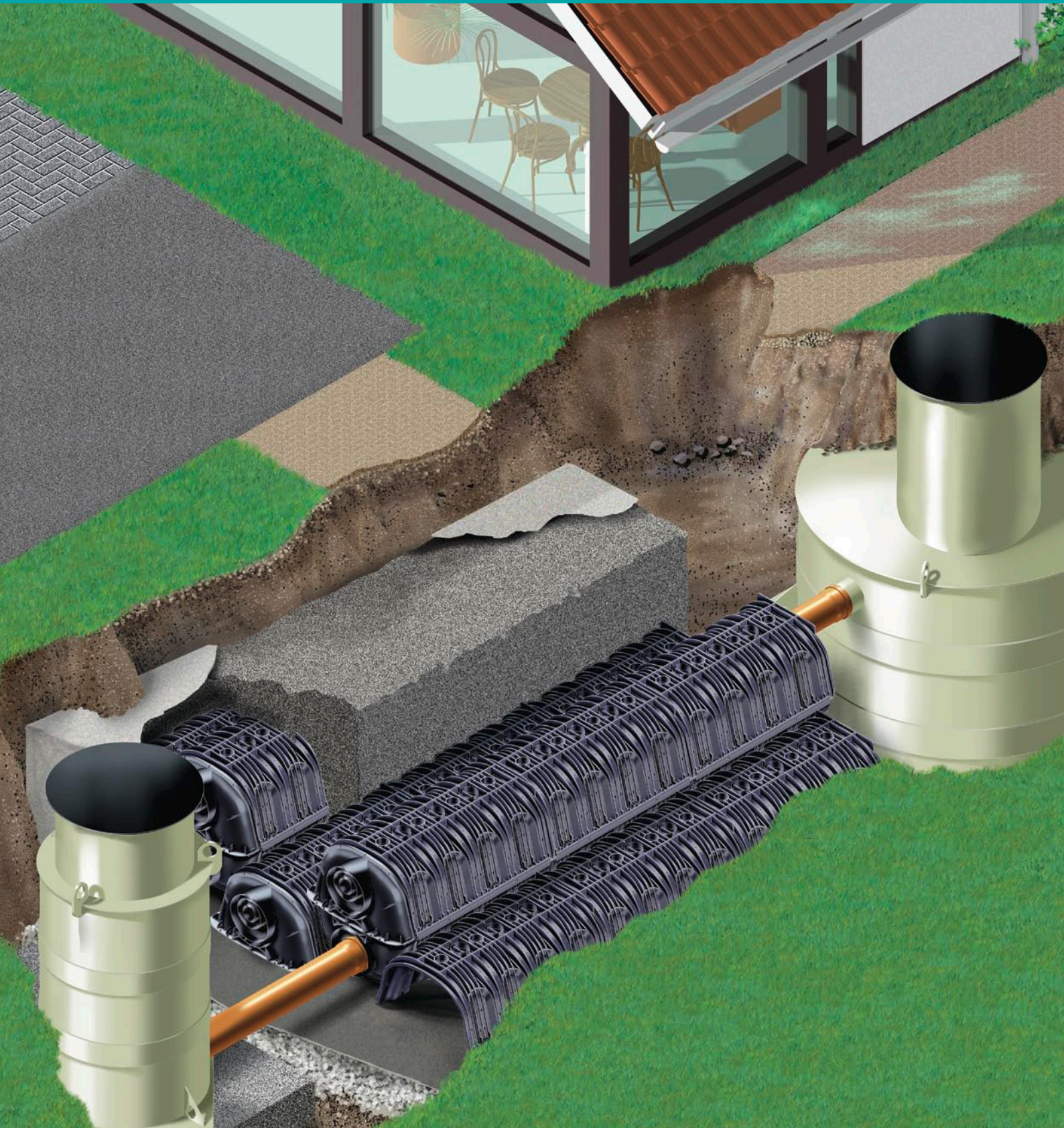
12. ____ no.. **CONNECTION ADAPTER**
for DRAINFIX BLOC, made from PP, for securing different layers of DRAINFIX BLOC against thrust, height 100 mm, art. no. 96110. When blocks laid in rows use 6 pieces, when laid in several layers use 4 pieces for each 2.40 m x 2.40 m area.
13. ____ no. **GEOTEXTILE, BY THE ROLL**
white, for wrapping up DRAINFIX BLOC, made from PP fleece, mechanically reinforced GRK 3, weight 200 g/m², length of roll 100 m, width of roll 4 m, art. no. 96120
14. ____ no. **GEOTEXTILE, BY THE METRE**
white, for wrapping up DRAINFIX BLOC, made from PP- fleece, mechanically reinforced GRK 3, weight 200 g/m², width 4 m, art. no. 96130

**TENDER PROPOSALS
ARE AVAILABLE AT
WWW.HAURATON.COM**

DRAINFIX®TWIN

HIGH VOLUME IN THE SMALLEST SPACE.

THE DOUBLE TUNNEL SYSTEM FOR USE UNDER LIGHT TRAFFIC ROADS.



AT A GLANCE

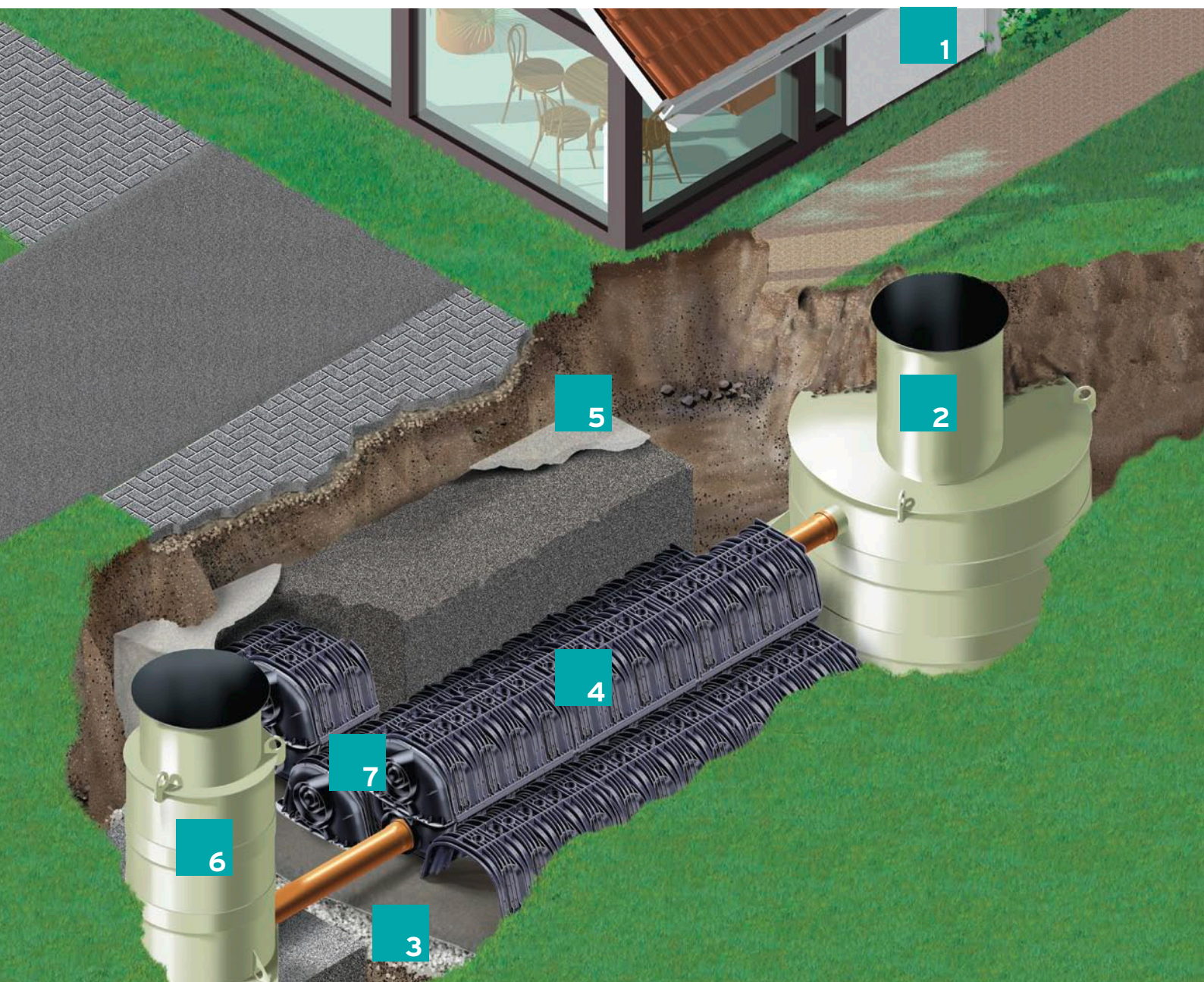
- ✓ Strong performance
 - suitable for passenger car loading
 - very large storage volume
 - areas remain free to be used
- ✓ Simple to install
 - very lightweight elements
 - easy modular installation
 - fully extendable
 - flexible installation alignment due to variable combinations
- ✓ Transport advantages
 - element halves stack into each other
 - low transport volume
 - low transport costs



DRAINFIX®TWIN

HIGH VOLUME IN THE SMALLEST SPACE.

THE DOUBLE TUNNEL SYSTEM FOR USE UNDER LIGHT TRAFFIC ROADS .



1

Water inlet pipe

Stormwater collection pipe channels water into the SHAFT

2

Water treatment plant

individual dimensioned plant to treat and filter dirt particles

3

Road level

Granular subbase on ground with infiltration capability

4

Infiltration element

DRAINFIX TWIN elements with high storage volume and even infiltration performance

5

Geotextile

Can be used to protect the infiltration trench from silting up (optional)

6

Flushing and control chamber

Flushing and control chamber for the control, cleaning and maintenance of the infiltration system

7

Combi end cap

End caps for closing the element ends or for connecting to SHAFT or drainage system

REQUIREMENTS

Decentralised infiltration facility in private and public areas with low traffic volumes. The elements used to fill the infiltration structure should be lightweight and easy to handle and offer maximum storage capacity for small space requirement. The material must be durable and strong. The surface area should remain usable.

SOLUTION

DRAINFIX TWIN are combinable infiltration elements with particularly large storage capacity. This large available volume makes it possible to collect large quantities of water. Subsequently, the water will be slowly released to the surrounding soil. Compared to conventional gravel-filled infiltration structures, site requirements and excavation are reduced by 2/3. The surface areas remain fully usable for other purposes.

APPLICATION AREAS

Collecting and storing stormwater for infiltration from sealed ground surfaces in private and public areas with low traffic volumes.

Depending on the installation details, the load class will range from pedestrian to passenger car traffic.

TRANSPORT ADVANTAGE

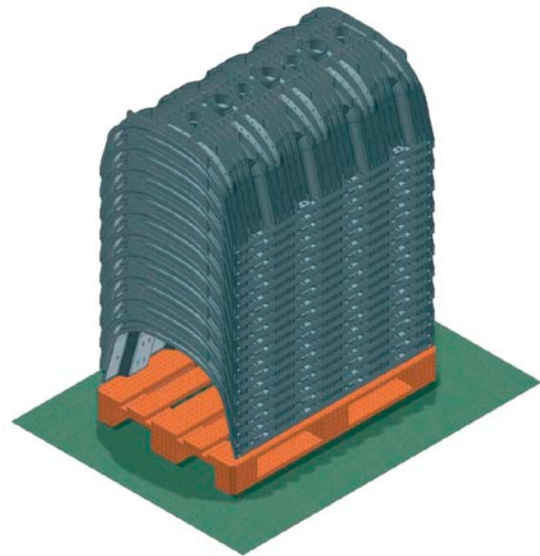
One Euro pallet will carry 32 stacked elements, which corresponds to approx. 8.1 m storage volume. It means favourable transport costs and small space requirements during storage.

DRAINFIX WATER TREATMENT PLANT

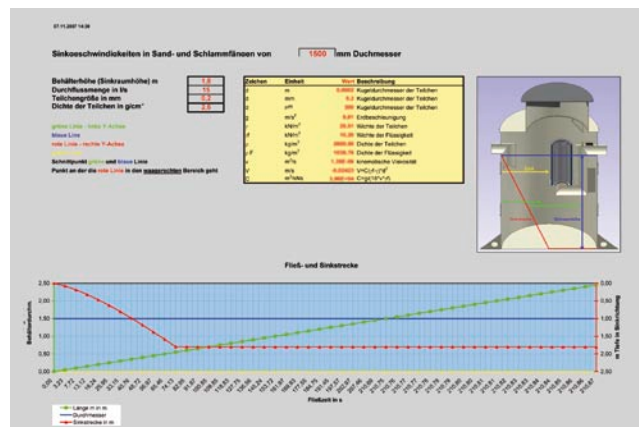
DRAINFIX Water treatment plants prevent dirt particles entering the infiltration system and protect it. With the aid of gravitation bigger dirt particles are sedimented in the individual dimensioned sedimentation zone. An extra built filter makes sure in the second step that also the smallest dirt particles are filtered. Size and design of these plants were dimensioned for each building project under consideration of all influencing factors (e.g. rainfall quantity and kind of dirt). HAURATON experts can support you for the dimensioning.



Huge back pressure volume



Stack of elements on pallet



DRAINFIX®TWIN

HIGH VOLUME IN THE SMALLEST SPACE.

THE DOUBLE TUNNEL SYSTEM FOR USE UNDER LIGHT TRAFFIC ROADS.

INFILTRATION SYSTEM USING VARIABLE PLASTIC ELEMENTS

DRAINFIX TWIN is a system solution for decentralised infiltration of stormwater in private and public spaces. The very large storage volume offers much reserve space for very sudden stormwater precipitation. The innovative design makes it possible to join the elements together in order to firmly connect individual elements to each other. The system is rounded off with end caps, SHAFTs and closed DRAINFIX TWIN elements for sedimentation and inspection.





1

■ DRAINFIX TWIN 1/1 made from plastic, with drainage holes, for retention and infiltration discharge of stormwater

■ The combination with elements without drainage holes allows numerous installation constellations

2

■ Plastic end cap with variable connection option to pipes DN 200 and DN 300

3

■ Multi-function plastic SHAFT DN 400 for inspection or filtering

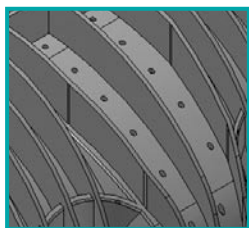
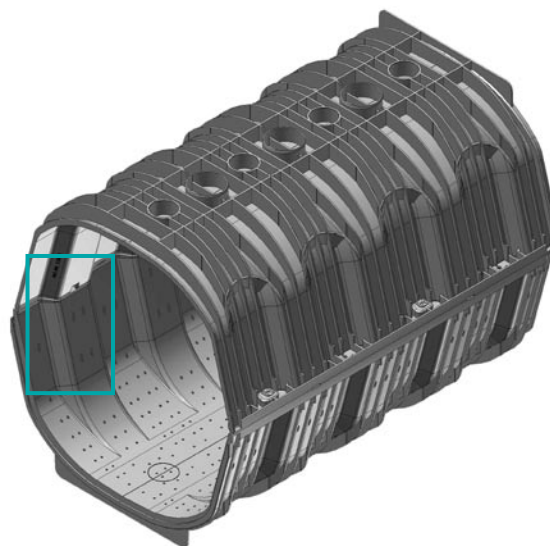
UNIQUE IN THE MARKET

- ✓ Elements with and without drainage holes can be combined
- ✓ Maximum variety of applications with only 2 elements
- ✓ Optimal capacity effect per area

DRAINFIX®TWIN

COMBINATION OPTIONS OF DRAINFIX TWIN ELEMENTS

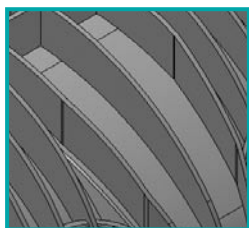
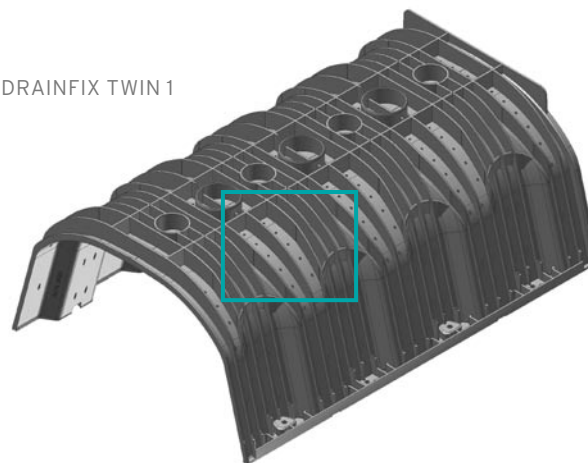
combination options to configure the ideal solution for different situations. Using the two basic elements DRAINFIX TWIN 1 with drainage holes and DRAINFIX TWIN 0 without drainage holes it is possible to configure six different combinations. These six combinations can be used to advantage to match the requirements of different situations on site. The aim is find an optimum combination of elements to suit the ground conditions and the characteristics of the elements. With just a few elements DRAINFIX TWIN offers maximum adaptability to ground conditions and the situation on site.



DRAINFIX TWIN 1

Element with drainage hole. Particularly suited for use in high or medium groundwater level areas.

DRAINFIX TWIN 1



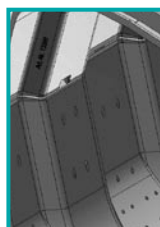
DRAINFIX TWIN 0

Element without drainage hole. Particularly suitable for installation underneath sealed surfaces or installations without separate gravel packing.



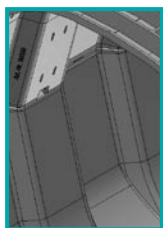
DRAINFIX TWIN 1/1

Upper and lower element have drainage holes. This combination is indicated for maximum infiltration discharge.



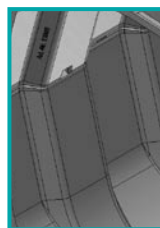
DRAINFIX TWIN 0/1

Only the lower element has drainage holes. This combination is particularly suitable where the dug out spoil is re-used.



DRAINFIX TWIN 1/0

Only the upper element has drainage holes. This combination is particularly suitable for sedimentation flushability of the infiltration structure.

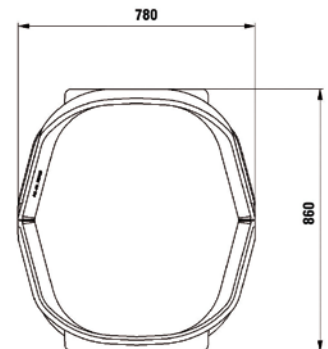
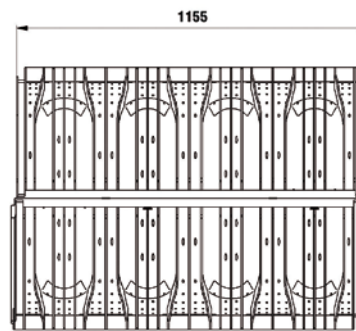


DRAINFIX TWIN 0/0

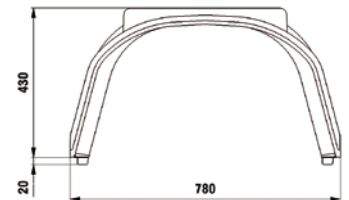
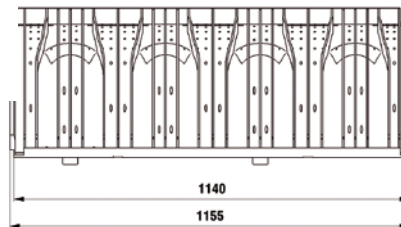
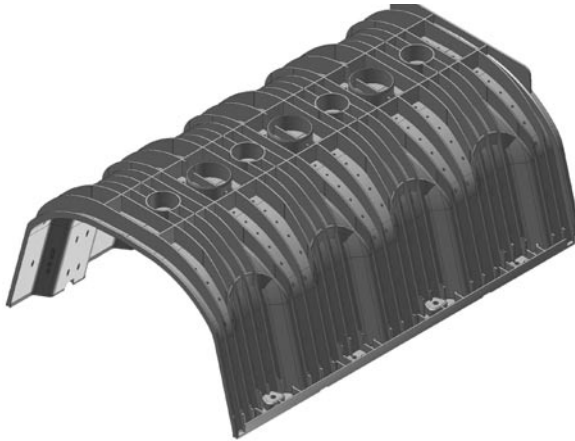
Neither the upper nor the lower element have drainage holes. The combination with closed elements is suitable as a sedimentation zone.

DRAINFIX®TWIN - Seepage element made of PP

TWIN 1/1, black (2 parts)*



TWIN 1, black (1 part)



	Length mm	Width mm	Height mm	Weight kg	Article No.
TWIN 1/1, black (2 parts)*	1155	780	860	23,0	96550
TWIN 0/0, black (2 parts), closed*	1155	780	860	23,0	96610
TWIN 0/1, black (2 parts), upper part closed*	1155	780	860	23,0	96650
TWIN 1/0, inspection, black (2 parts), lower part closed*	1155	780	860	23,0	96660
TWIN 1, black (1 part)	1155	780	430	11,5	96500
TWIN 0, black (1 part), closed	1155	780	430	11,5	96600

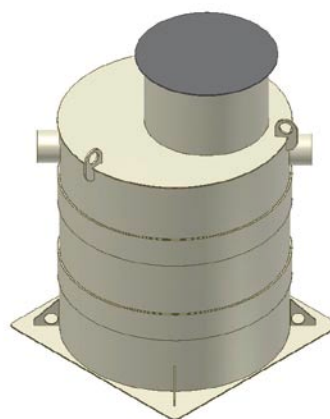
* including 4 times DRAINFIX TWIN fixing and 2 DRAINFIX TWIN connection clip.

DRAINFIX®TWIN

DRAINFIX® - Rainwater treatment plants



Type 10



Type 15

	Length mm	Width mm	Height mm	Weight kg	external diameter mm	Flow capacity l/s	Article No.
Type 10	1000	1000	2345	-	950	6	96450
Type 12	1200	1200	2480	-	1190	10	96460
Type 15	1500	1500	2704	-	1430	15	96470
Type 20	2000	2000	2804	-	1910	20	96480
Type 25	2500	2500	2654	-	2380	25	96490

All DRAINFIX - Rainwater treatment plants (ATV) are also applicable for DRAINFIX BLOC.

DRAINFIX® - Multifunction shafts



Filter shaft* 400/1500 with fine filter cartridge, with ductile iron grating, closed, class B 125

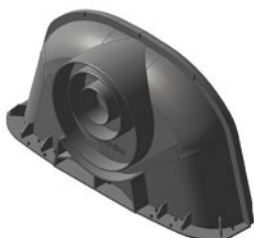


Discharge shaft DN 1000 with inlet and outlet DN 150

	Length mm	Width mm	Height mm	Weight kg	Article No.
Filter shaft* 400/1500 with fine filter cartridge, with ductile iron grating, closed, class B 125	400	-	1673	-	96710
Filter shaft* 400/1500 with fine filter cartridge, with ductile iron grating, closed, class D 400	400	-	1673	-	96720
Filter shaft* 400/2000 with fine filter cartridge, with ductile iron grating, closed, class B 125	400	-	2173	-	96760
Filter shaft* 400/2000 with fine filter cartridge, with ductile iron grating, closed, class D 400	400	-	2173	-	96770
Multifunction shaft* 400/1500 with ductile iron grating, closed, class B 125	400	-	1673	-	96715
Multifunction shaft* 400/1500 with ductile iron grating, closed, class D 400	400	-	1673	-	96725
Multifunction shaft* 400/2000 with ductile iron grating, closed, class B 125	400	-	2173	-	96765
Multifunction shaft* 400/2000 with ductile iron grating, closed, class D 400	400	-	2173	-	96775
Discharge shaft DN 1000 with inlet and outlet DN 150	1000	-	2345	-	96890

* Height adjustable via telescope adaptation

DRAINFIX®TWIN - Accessories



End cap, black

	Length mm	Width mm	Height mm	Weight kg	Article No.
End cap, black	192	780	430	2,5	96530
Geotextile from PP-fleece GRK3 rollware 4 x 100 m, 200 g/m ²	-	-	-	80,0	96120
Geotextile from PP-fleece GRK3, by the metre 4m ² / to cat	-	-	-	0,2	96130

TENDER PROPOSALS

DRAINFIX TWIN INFILTRATION ELEMENTS

1. ____ no. **DRAINFIX TWIN 1/1,**
black, made from PP, element for infiltration trench, suitable for retaining, storing and releasing stormwater for infiltration, including 4 x DRAINFIX TWIN locking and 2 DRAINFIX TWIN connector brackets, load class for passenger cars, volume 506 l, l/w/h 1155 x 780 x 860 mm, weight 23.0 kg, art. no. 96550
To be supplied and laid in accordance with the manufacturer's installation instructions.
Quality in acc. with DIN EN ISO 9001:2000
Manufactured by: Hauraton GmbH & Co. KG
P. O. Box 16 61
D-76437 Rastatt, Germany
Tel.: +49-7222-958-0
Fax: +49-7222-958-102
E-Mail: export@hauraton.com
2. ____ no. **DRAINFIX TWIN 1/0,**
black, made from PP, element for infiltration trench, suitable for sedimentation and retention of stormwater, including 4 x DRAINFIX TWIN locking and 2 DRAINFIX TWIN connector brackets, load class for passenger cars, volume 506 l, l/w/h 1155 x 780 x 860 mm, weight 23.0 kg, art. no. 96650
3. ____ no. **DRAINFIX TWIN 0/1,**
black, made from PP, element for infiltration trench, suitable for retaining, storing and releasing stormwater for infiltration, including 4 x DRAINFIX TWIN locking and 2 DRAINFIX TWIN connector brackets, load class for passenger cars, volume 506 l, l/w/h 1155 x 780 x 860 mm, weight 23.0 kg, art. no. 96660
4. ____ no. **DRAINFIX TWIN 0/0,**
black, made from PP, element for infiltration trench, suitable for sedimentation and retention of stormwater, including 4 x DRAINFIX TWIN locking and 2 DRAINFIX TWIN connector brackets, load class for passenger cars, volume 506 l, l/w/h 1155 x 780 x 860 mm, weight 23.0 kg, art. no. ____
5. ____ no. **DRAINFIX TWIN 1**
black, made from PP, element for infiltration trench, suitable for retaining, storing and releasing stormwater for infiltration, load class for passenger cars, volume 253 l, l/w/h 1155 x 780 x 430 mm, weight 11.5 kg, art. no. 96500
6. ____ no. **DRAINFIX TWIN 0,**
black, made from PP, element for infiltration trench, suitable for sedimentation and retention of stormwater, also suitable for inspecting DRAINFIX TWIN infiltration systems, load class for passenger cars, volume 253 l, l/w/h 1155 x 780 x 430 mm, art. no. 96600

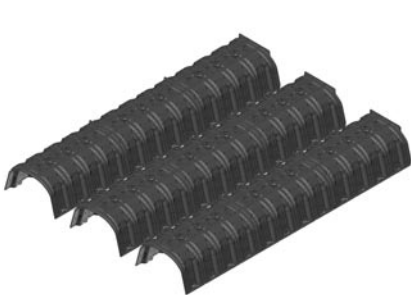
ACCESSORIES

7. ____ no. **DRAINFIX RAINWATER TREATMENT PLANT TYPE 10**
DN 1000 mm for 6 l/s, inlet in front of DRAINFIX ditch including filter element and sedimentation space; pipe connection possibility DN 150; inlet height 794 mm, Shaft height 2345 mm, art. no. 96450
8. ____ no. **DRAINFIX RAINWATER TREATMENT PLANT TYPE 12**
DN 1200 mm for 10 l/s, inlet in front of DRAINFIX ditch including filter element and sedimentation space; pipe connection possibility DN 150; inlet height 876 mm, Shaft height 2480 mm, art. no. 96460
9. ____ no. **DRAINFIX RAINWATER TREATMENT PLANT TYPE 15**
DN 1500 mm for 15 l/s, inlet in front of DRAINFIX ditch including filter element and sedimentation space; pipe connection possibility DN 200; inlet height 896 mm, Shaft height 2704 mm, art. no. 96470
10. ____ no. **DRAINFIX RAINWATER TREATMENT PLANT TYPE 20**
DN 2000 mm for 20 l/s, inlet in front of DRAINFIX ditch including filter element and sedimentation space; pipe connection possibility DN 200; inlet height 896 mm, Shaft height 2804 mm, art. no. 96480
11. ____ no. **DRAINFIX RAINWATER TREATMENT PLANT TYPE 25**
DN 2500 mm for 25 l/s, inlet in front of DRAINFIX ditch including filter element and sedimentation space; pipe connection possibility DN 200; inlet height 941 mm, Shaft height 2219 mm, art. no. 96490
12. ____ no. **FILTER MANHOLE 400/1500**
made from PP, with closed cast iron cover, load class __, nominal width 400, with telescopic extension and integrated sludge trap and fine filter cartridge with inspection facility, incl. visual maintenance display, inlet and outlet spigot DN 150, manhole height 2,173 mm, can be extended up to 180 mm via continuous telescopic extension, art. no. _____
13. ____ no. **FILTER MANHOLE 400/2000**
made from PP, with closed cast iron cover, load class ____, nominal width 400, with telescopic extension and integrated sludge trap and fine filter cartridge with inspection facility, incl. visual maintenance display, inlet and outlet spigot DN 150, manhole height 2,173 mm, can be extended up to 180 mm via continuous telescopic extension, art. no. _____
14. ____ no. **MULTI-FUNCTION CHAMBER 400/1500**
made from PP, with closed cast iron cover, load class ____, nominal width 400, with telescopic adapter, inlet and outlet spigot DN 150, height of manhole 1,673 mm, can be extended up to 680 mm via continuous telescopic extension, functions: outlet, emergency overflow, venting, control, art. no. _____
15. ____ no. **MULTI-FUNCTION CHAMBER 400/2000**
made from PP, with closed cast iron cover, load class ____, nominal width 400, with telescopic adapter, inlet and outlet spigot DN 150, height of manhole 2,173 mm, can be extended up to 680 mm via continuous telescopic extension, functions: outlet, emergency overflow, venting, control, art. no. _____
16. ____ no. **DRAINFIX OUTLET SHAFT DN 1000**
with pipe connection possibility inlet and outlet DN 150, inlet height 794 mm, Shaft height 2345 mm, art. no. 96890
17. ____ no. **ENDCAP FOR DRAINFIX TWIN**
(2 pieces required for TWIN installation)
with combined outlet DN 100 / 200 / 300, art. no. 96530
18. ____ no. **GEOTEXTILE, BY THE ROLL**
white, for wrapping up DRAINFIX BLOC, made from PP- fleece, mechanically reinforced GRK 3, weight 200 g/m², length of roll 100 m, width of roll 4 m, art. no. 96120
19. ____ no. **GEOTEXTILE, BY THE METRE**
white, for wrapping up DRAINFIX BLOC, made from PP- fleece, mechanically reinforced GRK 3, weight 200 g/m², width 4 m, art. no. 96130

**TENDER PROPOSALS
ARE AVAILABLE AT
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DRAINFIX TWIN INSTALLATION OPTIONS

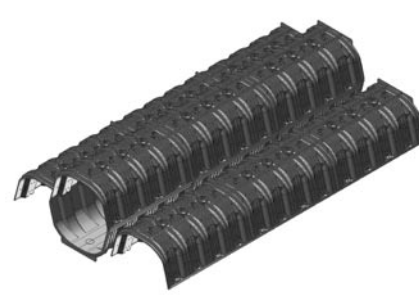
DRAINFIX TWIN elements not only provide a number of combination options but can also be varied in their installation configuration. This feature of the system makes it possible to make the best use out of the available construction space. In that way the infiltration structure can be designed to suit the respective requirements.



DRAINFIX TWIN 1 - (single layer) low height of excavation, high load-bearing capacity

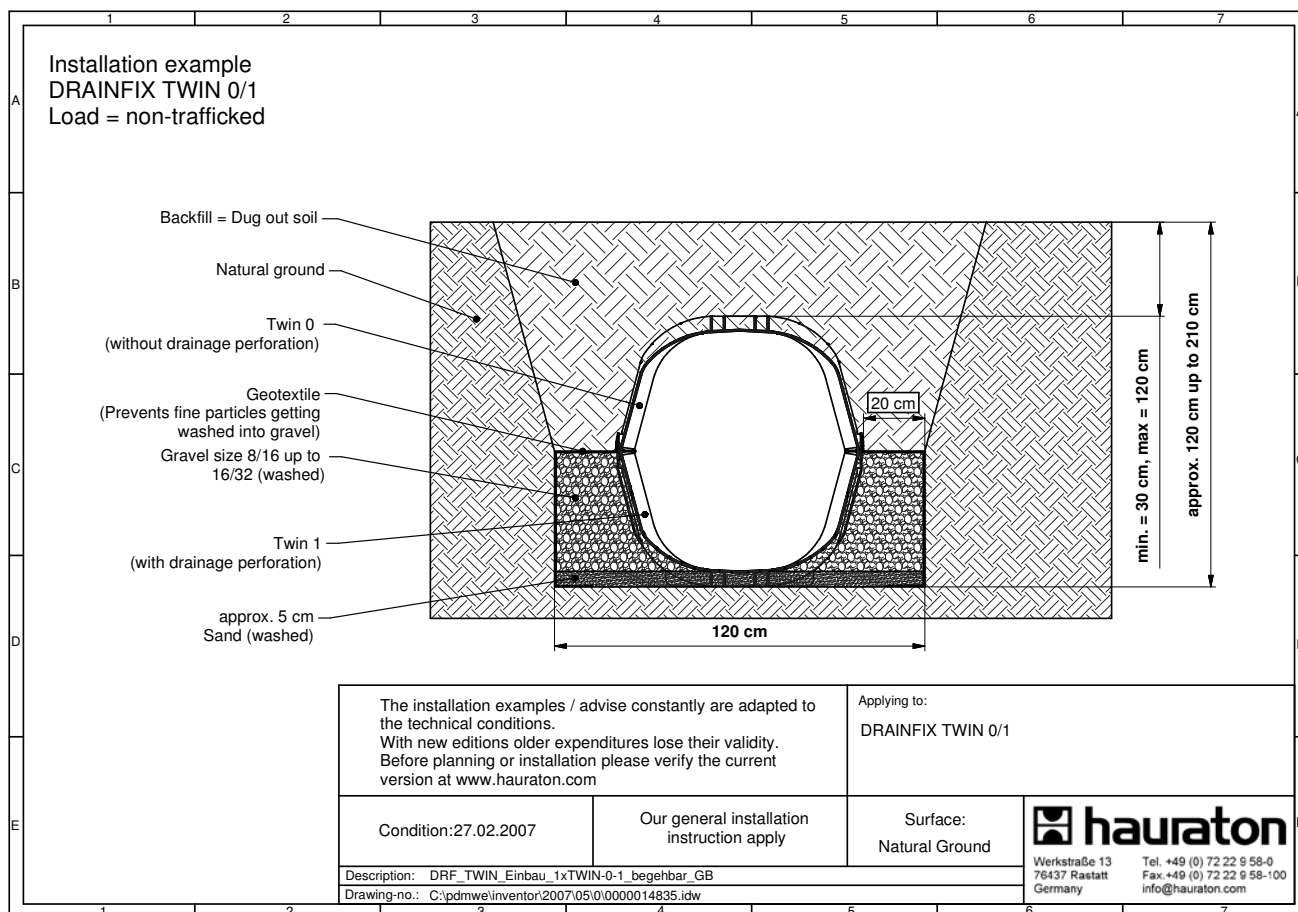


DRAINFIX TWIN 1/1 - (TWIN installation) large infiltration volume, medium load-bearing capacity of the infiltration structure



DRAINFIX TWIN 1/1 in combination with DRAINFIX TWIN 1 - (wave pattern) maximum volume for available area

INSTALLATION EXAMPLE



INSTALLING DRAINFIX TWIN

Prepare the pit and lay a level gravel subbase on the base of the pit, which should consist of soil with infiltration capability. Simply join the DRAINFIX TWIN elements together using the tongue and groove joint;



they will then form a homogenous system without cross bridges or braces within the infiltration cavity. Lay the elements and lock them into place using the connection brackets and the DRAINFIX TWIN locking device.



BACKFILLING THE INFILTRATION TRENCH

Once all connections have been made to SHAFTs and the system has been laid completely and closed at the ends with end caps, the infiltration trench is ready for backfilling. Fill material can be gravel or the spoil from digging out the trench.

Depending on the combination of DRAINFIX TWIN 1 and 2 elements it may not be necessary to insert a geotextile. Once the trench has been backfilled, the surface can be used for other purposes.

