



DRAINFIX[®]CLEAN

Drainage and treatment of runoff water in one system.



DRAINFIX® CLEAN

Rainwater treatment with filter substrate channel.

Systems for the effective and ecological treatment of surface runoff water.

Everybody is obliged to prevent discharge of polluted water into natural water bodies and therefore polluted water has to be treated before it is released into the natural water cycle.

DRAINFIX CLEAN system efficiently combines drainage channels with a runoff water treatment solution.

It is a certified filter channel system offering multiple benefits: It provides drainage, retention, treatment and discharge of runoff water in one system.

From an ecological point of view rainwater should be percolated on site.

- percolated rainwater contributes to a large extent to the formation of ground water
- built up and sealed areas prevent natural water circulation
- the quantity of runoff water increases considerably and overloads channels and treatment plants
- runoff water should be immediately percolated for ecological and economic reasons

Composition of dirt and pollutants in rainwater drains

Mineral materials, e.g. sand and clay particles (= greatest part)	No danger for the environment but it can significantly affect the efficiency of the rainwater treatment plant.
Organic components, e.g. leaves, pollen, grasses	
Heavy metals (copper, lead, zinc) from mechanical wear products in road traffic	Represent < 1% from total amount of pollutants, but they negatively affect health and in some cases are carcinogenic.
Polycyclic aromatic hydrocarbons (PAHs) from combustion processes, e.g. from engines	They must be filtered out and must not be allowed to enter the ground water.
Total petroleum hydrocarbons (TPHs), e.g. from drops falling from vehicles	

Runoff water can contain pollutants which must not be allowed to get into the ground water.

- rainwater, depending on the local situation, must be treated before being percolated
- filtering out of dirt and pollutants is a way to treat the runoff water



Advantages of DRAINFIX®CLEAN

All-in-one System

For the **effective treatment** of **runoff water**.

- + drainage**
- + retention**
- + treatment**
- + discharging**



DRAINFIX®CLEAN vs. separators | interceptors

Pollutant / Treatment	TPH liquid phase	TPH dissolved, dispersed	TPH ligated to solids	TSC ≥ 63 µm coarse fraction	TSC ≤ 63 µm fine fraction	Heavy Metals solids ligated to solids	Heavy Metals dissolved
Separator Interceptor	++	0	+	+	0	0	0
DRAINFIX®CLEAN Filter substrate channel	0 (regular operation) ++ (oil spill/ accident)	0	++	++	++	++	++
Suitable for: local specifications and legal regulations have to be adhered to	car wash areas petrol stations oil spills	metal works car wash areas	roads parking areas industrial areas				

TPH = Total Petrol Hydrocarbons
TSC = Total Solid Content

++ = very suitable
+ = limited suitability
0 = not suitable

Your benefits with DRAINFIX® CLEAN



High stability

- Withstands high traffic loads
- Resistance against temperature differences
- Stable and unbreakable material/channel system

= **Security**



Low weight ensures easy handling on site

- Much lighter compared to channels made of concrete
- Easy handling in stock and on site
- Cost-effective transportation

= **Cost savings**



Extremely long maintenance intervals

- First maintenance after 10 years (depends on local conditions)
- Only filter cake has to be removed, substrate lasts decades

= **Cost savings, security**



Renowned development partners

- The development of the system was monitored and supported by approved institutions
 - Bioplan: The experts for ecologically meaningful and cost saving drainage projects.
 - KIT: Karlsruhe Institute of Technology
 - AiF - supported project: The AiF supports research and development in small and medium sized companies.

- Technically certified in many countries

= **Security**



BIOPLAN

AiF
Ideen eine Zukunft geben

KIT
Karlsruhe Institute of Technology



Flexible system

- Adjustable to various requirements and local conditions
- Discharge of treated water:
 - Percolation into groundwater
 - Open water bodies
 - Surface water sewer network
- Tailor-made solutions

= Cost savings

DRAINFIX®CLEAN can be adapted to all planning and official requirements.



More usable surface

- All in one system:
 - drainage
 - retention
 - treatment
 - discharging
- More effective usage of area compared to other treatment systems, e.g. green swales
- No additional space requirement

= Cost savings / Flexibility



Excellent treatment effect

- Approved by German Institute for Building Technology (DIBt)
- Efficiency of treatment:
 - Total suspended solids (TSS): 99,5 %
 - Total petroleum hydrocarbons (TPHs): 99,9 %
 - Zn: 99,8 %
 - Cu: 99,8 %
- Complies with legislative requirements
- Treatment efficiency secured even in heavy rain events

= Security



after

before



High retention capacity

- Security even in heavy rain events

= Security



Scan this QR logo for **DRAINFIX®CLEAN** video:

DRAINFIX® CLEAN

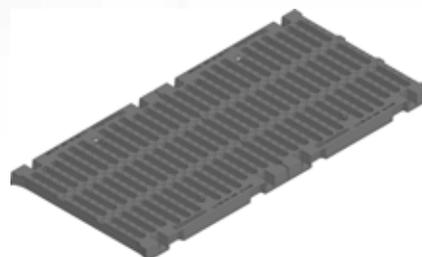
Rainwater treatment with filter substrate channel.

Systems for the effective and ecological treatment of rainwater.



1 Channel bodies

- RECYFIX
- high retention volume
- made of PP
- extreme stability, up to load class E 600



2 Gratings

- fullfills requirements according to EN 1433
- ductile iron gratings
- KTL coating if required
- load class up to E 600



3 CARBOTEC®60

- developed and patented by HAURATON
- longlasting high carbonate content
- binding of dissolved heavy metals
- filtration/retention of finest particles (0.006 to 0.060 mm)
- performance better than 30 cm of topsoil



4 Drainage pipe

- drainage pipe made of strong PEHD
- diameter 100 mm
- drainage pipe wrapped with geo-textile

DRAINFIX®CLEAN

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**Development on basis of
real-life testing since 2009**

The test plant in Augsburg

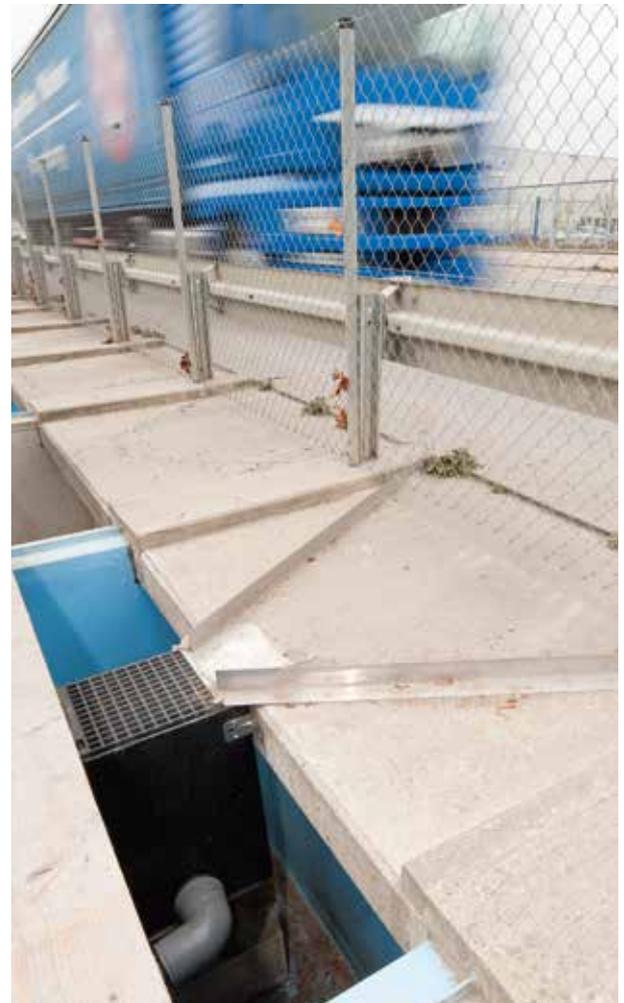


Dipl.-Ing. Benedikt Lambert, of Bioplan, doing sampling.

Field trials as the basis for product development: DRAINFIX®CLEAN test plant, Augsburg

Field trials have the decisive advantage over laboratory tests as procedures and developments can be measured and assessed under real conditions, for example, chemical-physical and biological processes or measurements throughout the whole year under different weather conditions. For many years HAURATON has operated the testing plant in the Derchinger Straße in Augsburg for the development of DRAINFIX CLEAN.

- Derchinger-Straße:
a very busy motorway slip road, up to 4,000 cars a day
- Measurement of different filter sizes under real conditions - without road cleaning.
- Development of a filter substrate that is suitable for many years of operation with high capacity pollutant retention
- Determination of the specific filter area necessary for years of continuous operation of the filter system without blocking
- Determination of the storage volume required to retain the pollutants for many years
- Determination of the necessary retention volume for security in heavy rains



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Rainwater treatment with filter substrate channel.

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Flexibility in discharging of treated water from the system.

Options:

- Discharge into ground water via percolation facilities
- Discharge into open water bodies
- Connection to the surface water sewer network



Percolation into groundwater via
DRAINFIX® TWIN



Open water body



Surface water sewer network



References from all over the world



Romania, Mamaia - Sand Drifts A Challenge for Filtration System 9,000 meters of DRAINFIX[®]CLEAN channels installed

Almost 9,000 meters of the DRAINFIX CLEAN channels were installed in one of the most popular Romanian seaside resorts Mamaia as a solution for draining and purifying runoff water. A system was required that could guarantee an efficient runoff water treatment performance while being easy to maintain, one which doesn't require replacing the filter material every time. Moreover, the composite channel bodies offer a high degree of corrosion resistance while withstanding stress caused by traffic and temperature differences. Furthermore, the channels are true lightweights and allow for comfortable installation. Even rough handling on site will not result in a ruptured channel.

As the project is located near the seaside, it had to be considered that wind drifts can cause substantial amounts of sand from the beach to form enormous sediment layers in a filter system. Committing to the principle of surface filtration based upon a filter's specific permeability, DRAINFIX CLEAN easily copes with the build up of sand and sediment layers. At the same time, it provides a sufficient filter area for the retention of solids and pollutants. Thus, the sand barely impacts the filter's functionality. Only in order to maintain the retention space within the channel is it occasionally necessary to remove the sand that has been washed into the channel. However, this can be done without having to exchange the filter substrate. This ensures a lasting and reliant storm water treatment for the beach promenade of Mamaia.





New Zealand, Auckland - Pikes Point Transfer Station Limited

Nowadays, rain water management concerns more and more projects all over the world, like, for example, the Waste management facility in Auckland, New Zealand. An exciting challenge of this project was to find a runoff water drainage and treatment system capable of removing both dissolved and particulate metal species (primarily copper, lead and zinc) in order to achieve compliance with discharge standards from the site and the marine receiving environment. DRAINFIX CLEAN, with its excellent treatment efficiency, was chosen as a fitting solution meeting all the requirements on quality of discharged water of a waste management plant.



United Kingdom, Lancashire - Darwen & Blackburn Sportcentre *

Runoff water from every outdoor car park contains high amounts of pollutants produced by the combusting processes in engines or as an oil or petrol leak from vehicles. Therefore, it is necessary to treat the surface runoff water from such places prior to discharging them back into nature. The car park project of Darwen & Blackburn Sportcentre, Lancashire in the UK was faced with this same issue. The challenge was an area of more than 400m² with asphalt surface. As a proper way out, it was decided to use the DRAINFIX CLEAN system. Today, the cleaned water from the car park discharges from the DRAINFIX CLEAN channel directly into an existing stream. Since 2011 the channels have been efficiently treating runoff water with no maintenance required so far.





Switzerland, Basel - Power plant *

Switzerland, with its natural beauty, is a country that pays close attention to protecting the environment as much as possible. The water power plant in Rheinfelden in Basel is a great example of how to use natural resources to create electricity and to protect the environment at the same time. This project thinks about water and nature conversion in many ways. That is why surface runoff water from sealed areas like car parks is drained and treated with DRAINFIX CLEAN channels.



France, Saint Chamond - Pole Industriel, Eco Quartier *

The Ökobezirk Novaceries in St Chamond was previously an industrial area which had to be remediated prior to any further usage in order to get the area into environment natural stand. The area was then transformed to be used as a place for private offices and small industrial companies of the St Etienne Metropole.

To preserve this place after remediation and protect the area from any new pollution, although there is everyday traffic of private cars and trucks, the St Etienne Métropole decided to install DRAINFIX CLEAN channels to deal with pollutants derived from cars and trucks. A total of 139 meters of DRAINFIX CLEAN channels were installed. The area was officially opened by Minister Cécile Duflot (Minister for Housing and Planning).



* This reference project is based on our DRAINFIX CLEAN solution with FASERFIX channels.



Germany, Walldorf - Sustainable concept for treating rainwater *

In building the new district, the local council and planners were pursuing long-term objectives. The public green spaces, southern park, rainwater seepage and other compensatory measures were integral parts of the ecological concept. Rainwater that tends to collect on the surface of roads and parking areas needs to be treated before it re-enters the ground water via the infiltration system. In Walldorf they decided on a completely new system: the DRAINFIX CLEAN filter substrate channel system from HAURATON. The purified water runs off via a filter mesh pipe at the channel base into the infiltration ditch and seeps away there.



* This reference project is based on our DRAINFIX CLEAN solution with FASERFIX channels.



Germany, Ettlingen - Office complex Square *

In 2013, 90m of DRAINFIX CLEAN channels were installed to drain and treat surface runoff water from various areas like walkways and parking spots at the project of Office Complex of Freyler and Ipsen Pharma Company in Ettlingen, Germany. The building itself belongs to the concept of sustainable buildings and therefore there were high demands for environmental-friendly and ecological solutions in dealing with runoff water and in protecting natural resources. The solution for rainwater management was achieved by the DRAINFIX CLEAN system. This is a great choice that meets all the requirements as this system offers many advantages in one - surface runoff water drainage, retention, treatment and discharge. Cleansed water is being percolated directly at the place of origin via infiltration blocks.



* This reference project is based on our DRAINFIX CLEAN solution with FASERFIX channels.

DRAINFIX® CLEAN references

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- Altrip, „Blaue Adria“ / Germany
- Bochum, Glockengarten / Germany
- Bad Homburg, Zeppelin street / Germany
- Berlin, Grünauer street 83-85 / Germany
- Beuerberg, Bus turning point / Germany
- Biblis, logisitcs centre Dietz / Germany
- Burgau, ROMA Rolladensysteme / Germany
- Bruckberg, Efaflex / Germany
- Dachau, Intaurus / Germany
- Darmstadt, Marienhospital / Germany
- Darwen & Blackburn Sportcenter / Darwen Vale High School - Darwen / Lancashire -Great Britain
- Eching, AUDI / Germany
- Erftstadt, REWE supermarket / Germany
- Eschbach, Haulotte / Germany
- Essingen, Hornbach logisitcs centre / Germany
- Ettlingen, ‚Square‘ office complex/ Germany
- Everswinkel, Nebelung warehouse / Germany
- Flörsheim-Dalsheim, Mittelstandsbahnhof ‚railway station‘ / Germany
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- Gaggenau, road B462 / Germany
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- Geretsried, Rudolf Chemie / Germany
- Gottenheim, NETTO supermarket / Germany
- Grafenwörth , Leitschutz / Austria
- Grevenbroich, Kita (nursery)/ Germany
- Gross Gerau, Hospital car park / Germany
- Großrosseln-Nassweiler, Fire brigade / Germany
- Hamburg, Elbquartier Blankenese / Germany
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- Haunstetten, Bakery Rager / Germany
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- Lahnstein, Fire brigade / Germany
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- Landeck, Huber Areal / Austria
- Laxenburg, Marktgemeinde / Austria
- Lohne, Polytec Plastics / Germany
- Lörrach, Burger King car park / Germany
- Ludwigshafen, FMZ / Germany
- Ludwigshafen, Toyota Stoltmann / Germany
- Mainz, Finther Land street / Germany
- Mamaia, Boulevard on the sea / Romania
- Mittenwalde, Göhler logistics / Germany
- Munich, Neue Balan 408 / Germany
- Munich, distribution center VW / Deutschland
- Neuenstadt, Business expansion Förch / Germany
- Niederaichbach, Logistics centre / Germany
- Oberesslingen, IH base / Germany
- Obertrum am See, OMV petrol station / Austria
- Pikes Point Transfer Station / New Zealand
- Poing, SBF distribution centre / Germany
- Power Plant / Switzerland
- Rastatt, Josef-Durler School / Germany
- Rheinfelden / Basel, Power plant / Germany, Switzerland
- Saint Chamond, Pole Industrial, France
- Siegen, Fire brigade / Germany
- Staufen, Railway station / Germany
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- Vienna, Expansion SPAR Esslinger street / Austria
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- Walldorf, Ecologis living district / Germany
- Walldorf, New housing development + social centre / Germany
- Waldkirch, New housing development Buchholz / Germany
- Wiener Neustadt, Holzwurm / Austria
- Wörgl, Morandell NB Warehouse / Austria
- Wörth a.d. Isar, Kirchanger EDEKA supermarket/ Germany
- Zwingenberg, Bahnhof street / Germany



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