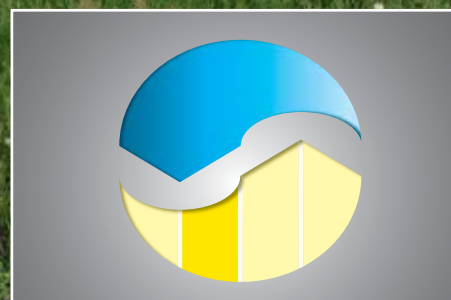




## SediSubstrator XL – High-end Stormwater Treatment

### Technical documentation



Last modified: November 2013



**DRAINAGE SYSTEMS**

**ELECTRICAL SYSTEMS**

**BUILDING TECHNOLOGY**

**INDUSTRIAL PRODUCTS**

# Innovative solutions to protect waterbodies

## Protection of waterbodies – a must for anyone

Our urbanised living environments frequently heavily pollute stormwater so that the direct discharge into the groundwater or surface waterbodies would pose a severe threat to the environment. Adequate stormwater treatment is necessary, which is also increasingly required by authorities.

Pollution results e. g. from road traffic, emissions from industrial facilities or from roof surfaces. Stormwater runoff can be polluted by the following materials:

- coarse organic or inorganic particles, e. g. sand, rocks, foliage
- fine and ultra-fine particles
- particle-bound pollutants, e. g. PAHs
- dissolved pollutants, e. g. heavy metals (e. g. copper, zinc and lead)
- light liquids such as gasoline and oil



Relevant regulations put precise demands on the treatment of polluted stormwater runoff. The DWA-A 138 worksheet, for example, requires the strict consideration of soil and water protection for the infiltration of stormwater runoff. Frequently, the DWA-M 153 bulletin is used as a basis for selecting a suitable treatment system.

The approval procedure of the German Institute for Civil Engineering (DIBt) for

the infiltration of stormwater runoff from trafficked areas currently represents state-of-the-art. Strict criteria and challenging tests guarantee that waterbodies are protected. With its two-step stormwater treatment system – sedimentation and adsorption in one system – SediSubstrator XL fully meets the requirements.

## SediSubstrator XL – stormwater treatment with DIBt approval

SediSubstrator XL is a stormwater treatment system for heavily polluted stormwater runoff, e. g. from trafficked areas. The system separates washed-up particles, particle-bound pollutants, dissolved heavy metals and light liquids (oil) from stormwater and reliably retains these

materials. SediSubstrator XL 600/12 and 600/12+12 have been tested according to strict DIBt requirements. This facilitates official approval procedures regarding stormwater infiltration systems and, depending on the country, also discharge into surface waterbodies.



**General building authority approval:  
DIBt – Z-84.2-11**

## SediSubstrator XL – substitutes the root zone

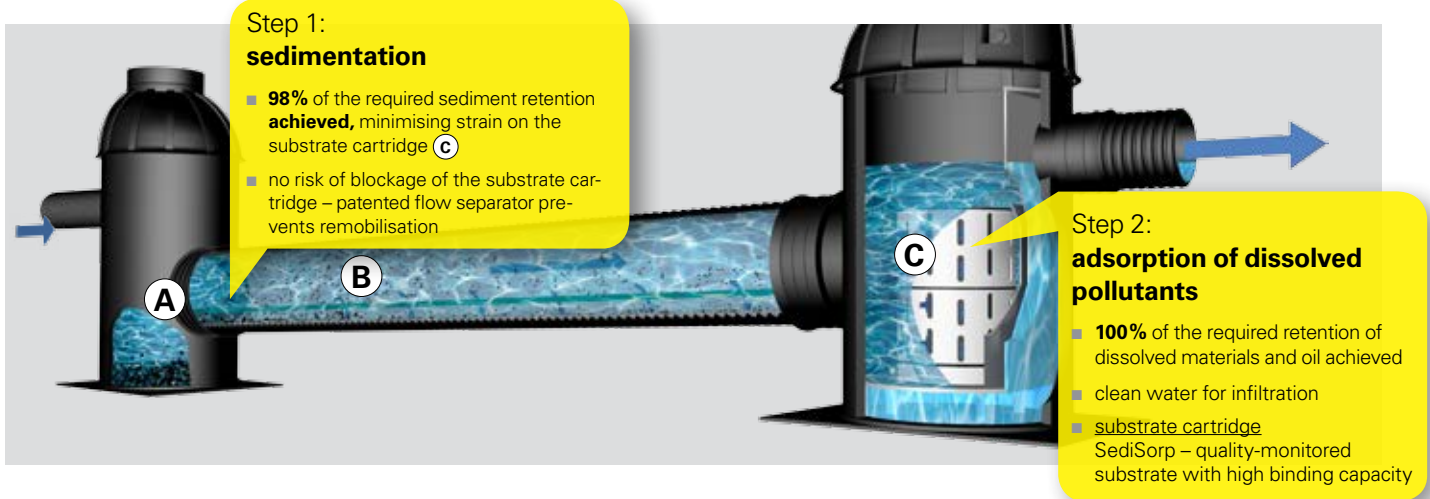
Infiltration into the root zone is the natural form of stormwater treatment featuring a high treatment performance. Above-ground systems, such as under-drained swale systems, treat water according to this principle. However, this

requires lots of space, usually 10% to 15% of the area to be drained – in urbanised areas frequently a significant problem.

SediSubstrator XL serves as a technical substitute of the root zone – but with relevant advantages:

- no space requirement
- DIBt-tested and always controllable treatment performance
- defined, professional elimination of pollutants

## Highly efficient: the two-step principle



### (A) (B) Sedimentation

- retention of **coarse particles** in the start shaft (e. g. rocks, sand)
- retention of **fine and ultra-fine particles** in the sedimentation pipe
- prevention of remobilisation of the sediment thanks to the patented flow separator
- large mud chamber for long operating intervals
- easy cleaning using common sewer cleaning technology

### (C) Adsorption of dissolved pollutants (substrate cartridge)

- retention of **dissolved pollutants** (e. g. heavy metals)
- retention of **light liquids / oil**
- high binding capacity of the SediSorp substrate
- easy substrate change without requiring access to the shaft

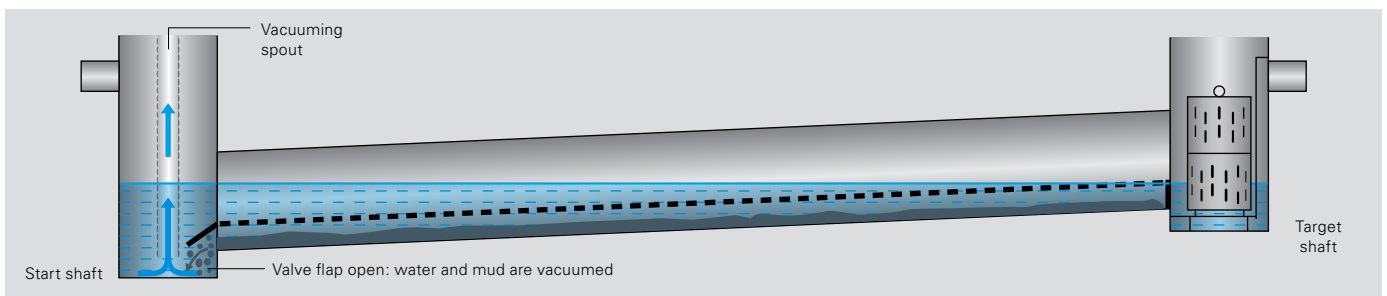
## Easy maintenance

### Sedimentation unit

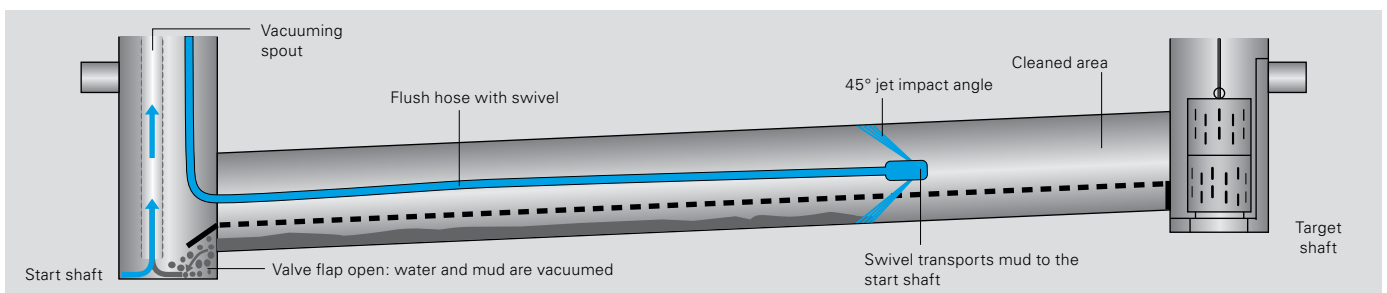
The system is maintained using common sewer cleaning methods. It keeps a constant water level which ensures that the

sediment remains muddy. The contents of the system are vacuumed from the start shaft. The valve flap opens and

releases the sediment to the lowest point. The system is then cleaned and can be operated again.



Depletion with vacuuming spout



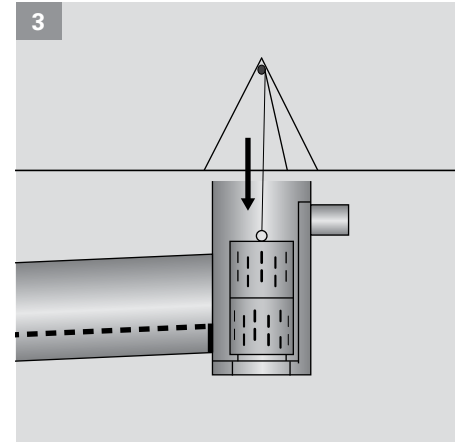
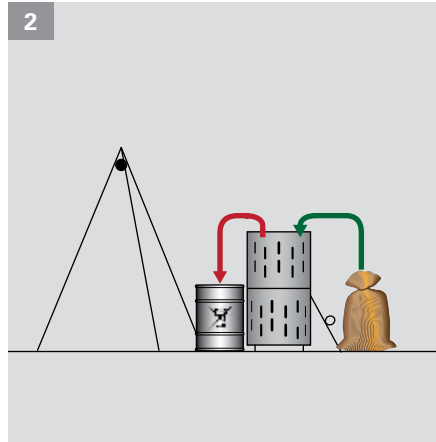
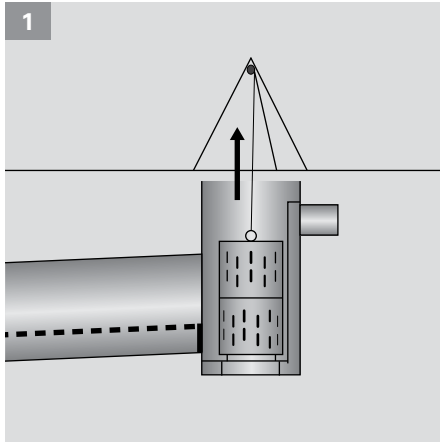
Cleaning with vacuuming spout and flush hose



# Easy maintenance

## Substrate cartridge

1. Remove cartridge elements from shaft for maintenance.
2. Exchange filter substrate (SediSorp) on site.
3. Return refilled substrate cartridge - done!



### NB:

Maintenance and inspection must be performed by qualified personnel only. Please find detailed descriptions and images in the SediSubstrator XL maintenance manual: [www.fraenkische.com](http://www.fraenkische.com)



## Fields of application

High amounts of pollutants can be expected in trafficked areas where vehicles frequently start, brake or manoeuvre. These include:

- intersections
- highly frequented access roads
- highly frequented parking lots
- commercial and industrial premises with lorry traffic

SediSubstrator XL is the best-suited system to treat stormwater runoff in these cases.

### Benefits for the operator

- facilitated approval according to water regulation thanks to DIBt approval
- long operating intervals thanks to large mud chamber and high cartridge capacity
- reliable two-step principle – no risk of blockage of the adsorption cartridge
- easy cleaning from "above" using common sewer cleaning technology – no access required!
- inexpensive maintenance thanks to substrate change – no cartridge replacement required!

### Benefits for planning and installation

- recommended pass-through value according to DWA-M 153 bulletin for DIBt-approved systems: 0.15 (analogous systems D11, tab. A.4b)
- for connected areas up to 3,000 m<sup>2</sup>
- space-saving installation in the sewer network also under trafficked areas
- easy installation – pre-fabricated complete system with ready-to-connect shafts

Recommended pass-through value according to DWA-M 153 bulletin for DIBt-approved systems

**0.15 (D11)**

# Fields of application

## Planning

SediSubstrator XL can be perfectly tailored to the specific project requirements. The installation size is simply selected according to the area to be

treated. The 600/12+12 system can be used for two separately connected areas.

SediSubstrator XL system overview

Type	Connected area (m <sup>2</sup> )	Sedimentation path		Number of cartridge elements	Design discharge according to DIBt test principles [l/s]
		DN	Length (m)		
600/12*	1,500	600	12	2	15.0
600/18	2,250	600	18	3	22.5
600/24	3,000	600	24	4	30.0
600/12+12*	1,500+1,500	600	12+12	4	15.0+15.0

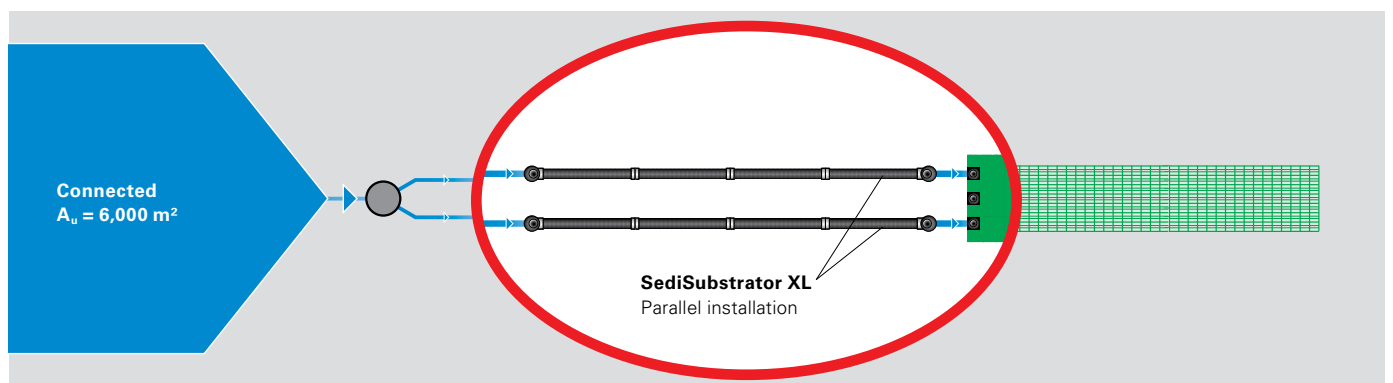
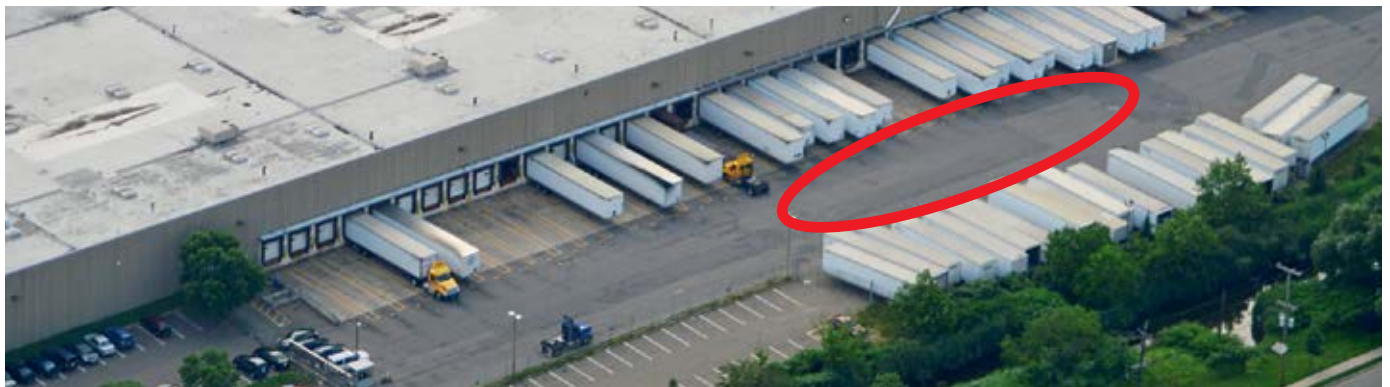
\* System with DIBt approval

According to the DIBt test principles, a load case for rain of 100 l/(s\*ha) is hydraulically tested. The network-hydraulical relationships must be analysed for each specific project. The DIBt test principles do not demand including

an emergency overflow in the system. A project-specific installation outside of the system, e. g. in separate receiving waters, must be agreed with the approving authority, if necessary.

## Installation examples

### SediSubstrator® XL 600/24



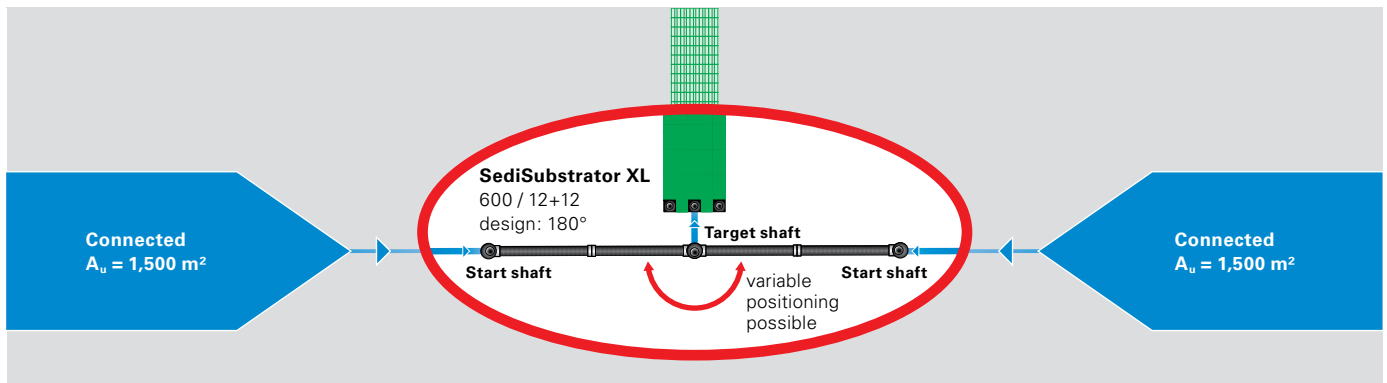
Treatment of run off from a commercial property with heavy lorry traffic prior to discharge into a detention/infiltration unit according to DWA-M 153. Connected area  $A_u = 6,000 \text{ m}^2$

# Installation examples

## SediSubstrator XL 600/12+12

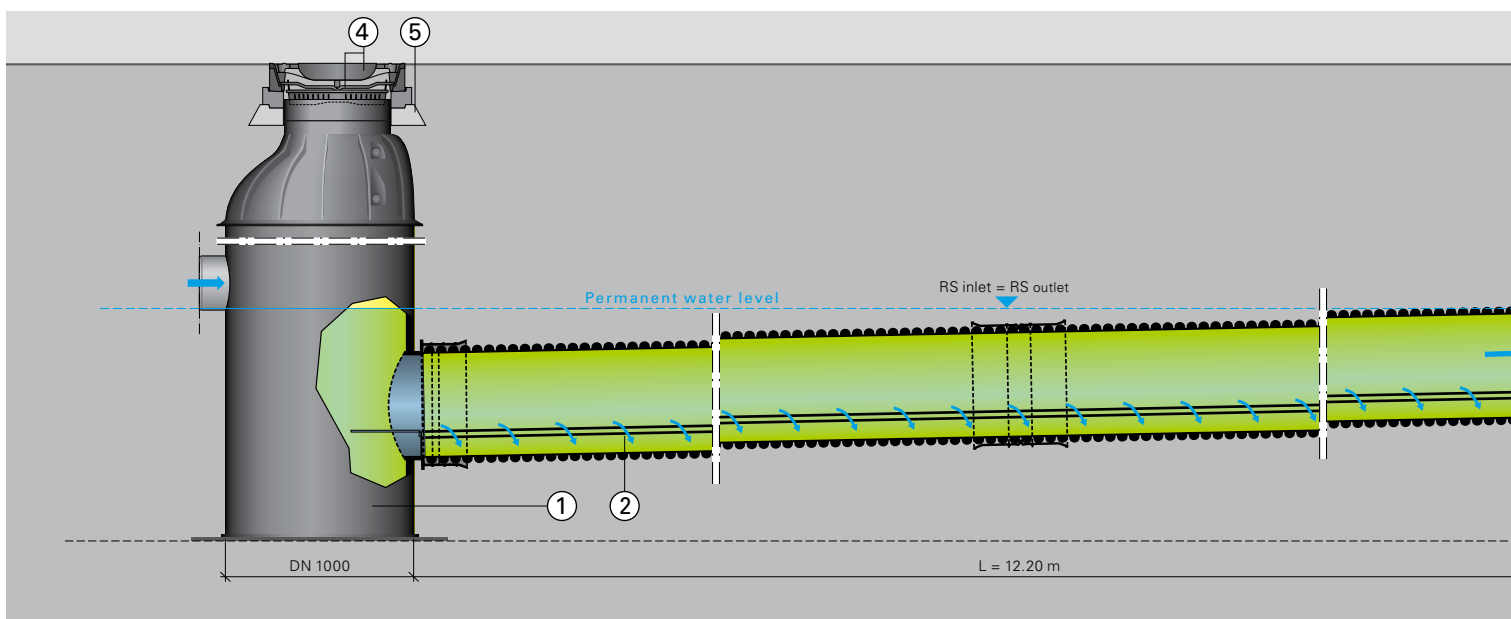
Two sedimentation paths are connected to a target shaft with substrate cartridge. 1,500 m<sup>2</sup> can be connected to each start

shaft. The angle between the two sedimentation paths can be freely selected between 90° and 180°.



SediSubstrator XL as pre-treatment upstream of infiltration systems at a heavily trafficked lorry rest area.  
Connected area  $A_u = 2 \times 1,500 \text{ m}^2$

## SediSubstrator XL 600/12 cross-section



System example in connection with Rigofill inspect detention/infiltration system

# SediSubstrator XL at a glance

## NB

Select project-specific details according to the plan:

- invert height inlet, outlet
- shaft heights

Use SediSubstrator XL order form!  
[www.fraenkische.com](http://www.fraenkische.com)



Substrate cartridge

## Stormwater treatment system, consisting of:

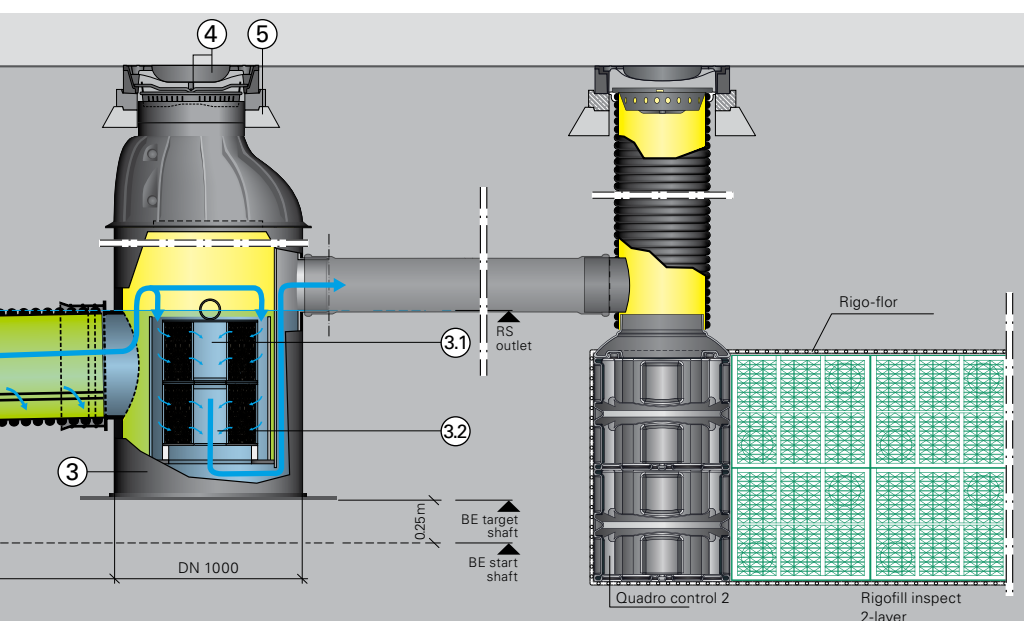
- start shaft DN 1000 with inlet, maintenance console, mud collector, cone with BARD ring (shaft cover to be ordered separately)
- sedimentation path DN 600 with patented flow separator including couplings, sealing rings and lubricant
- target shaft DN 1000 with outlet DN 300, cartridge elements, cone and BARD ring (shaft cover to be ordered separately)

## Application:

Treatment of highly polluted stormwater runoff when large areas are connected with subsequent infiltration.

Product	Technical data	Cat. no.
SediSubstrator XL 600/12*	Sedimentation path DN 600, length: 12 m; two cartridge elements	<b>515.98.692</b>
SediSubstrator XL 600/18	Sedimentation path DN 600, length: 18 m; three cartridge elements	<b>515.98.693</b>
SediSubstrator XL 600/24	Sedimentation path DN 600, length: 24 m; four cartridge elements	<b>515.98.694</b>
SediSubstrator XL 600/12+12*	Sedimentation path DN 600, length: 2 x 12 m, four cartridge elements	<b>515.98.690</b>

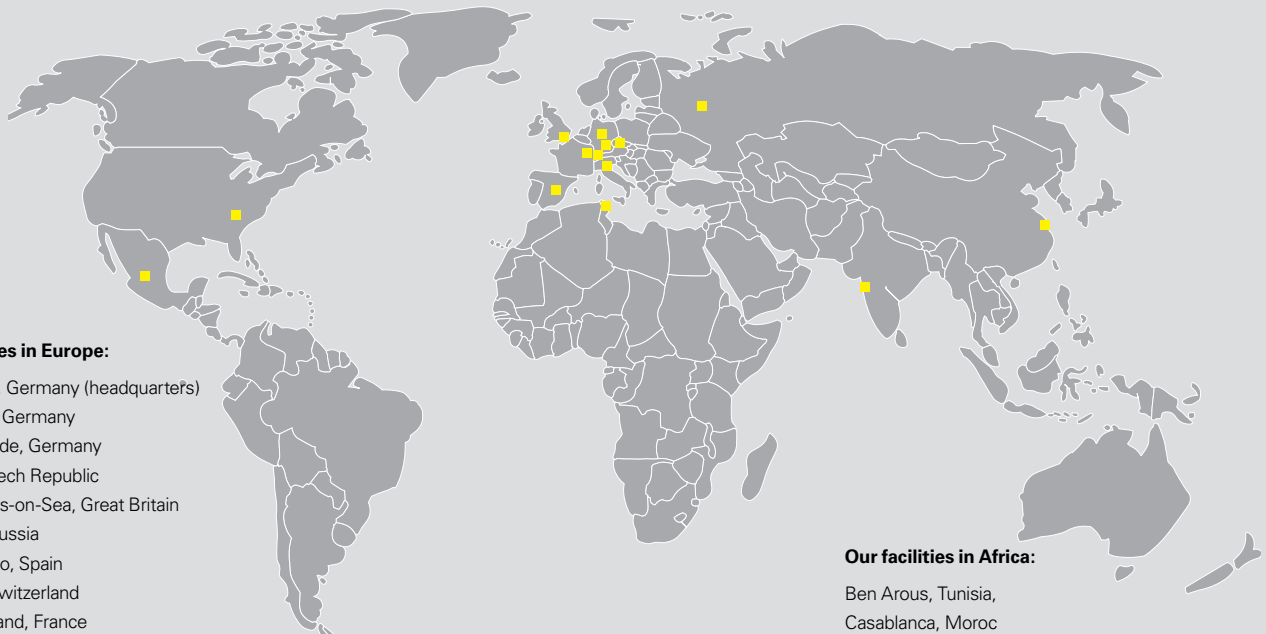
\* System with DIBt approval



## Caption

- ① Start shaft DN 1000 with inlet, maintenance console and mud collector
- ② Sedimentation path DN 600 with flow separator
- ③ Target shaft DN 1000 with cartridge elements
- ③.1 Cover element
- ③.2 Base element
- ④ Shaft cover CW 610 with ventilation openings and dirt trap according to DIN 1221 (on site)
- ⑤ BARD ring (concrete support ring)

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