



Protecting precious
water sources

ACO Stormwater

Management

ACO Filter Media Storm



The stormwater filter with a small footprint

When space is limited, ACO Stormclean is a compact alternative to large soil filters. **At the core of ACO Stormclean is ACO Filter Media Storm.** ACO Stormclean is official third party tested (DIBt) for removal efficiencies for sediments, heavy metals and hydrocarbons.



Transport and storage

Excessive agitation during transport and storage can act to pulverize the material. Storage bags should be closed to prevent the ingress of moisture and debris. Do not place storage bags in direct sunlight, as the plastic packaging may be UV sensitive.



For more information about ACO Stormwater Management see the full-video animation





Safety information

Dust may be generated during handling. A dust mask should be worn when handling the material outside of its storage bag. All known chemical-safety precautions are applicable.



Delivery

1m³ PE woven big bags.



Disposal

Local rules and regulations apply.

ACO Stormwater Management

ACO Filter Media Storm

Stormwater runoff can transport human pollutants generated in urban areas to the wider environment. Two key sources of urban pollution are vehicles and the use of metal roofing materials. Over time heavy metals, oils and particles from roofs and vehicles build up on impervious surfaces such as pavements, carparks, major roads, and motorways. Rainfall and snowmelt then remobilise these pollutants and transports them to receiving waters. This reduces the quality of surface water, ground water and soils.

Stormwater quality improvement devices (SQIDs) are commonly used to prevent this transport by removing pollutants from stormwater before it leaves the urban environment. The simplest treatment method is sedimentation, which removes suspended solids (particles) and any associated bound pollutants. However, these devices struggle to remove smaller particles and cannot remove dissolved pollutants. Reactive filtration materials such as **ACO Filter Media Storm** offer a solution to this problem and improve water quality even further. A carefully engineered mixture of granule sizes allows the filter to remove small particle sizes without clogging. In addition, the choice of special granules capable of adsorbing key pollutants such as Zinc (Zn), Lead (Pb), Copper (Cu) and oil ensure dissolved pollutants are removed and retained by the filter. **ACO Filter Media Storm is perfect for a decentralised stormwater filter. It protects surface waters and enables safe ground water infiltration, protecting precious ground water sources.**

CLEAN:
pre-treat and process



Many filter materials are available on the market. All filter materials combine filtration and chemical removal (chemisorption) to treat stormwater. No material is perfect, so mixtures of different materials are often used. Common materials include zeolite, granular ferric hydroxide, activated carbon, and others. The large specific surface area of these materials means there is plenty of space for chemisorption to happen. Successful filter materials must overcome other problems like de-icing salts, changes in pH and filter blocking.

One material weakness is balanced out by another materials strength

ACO Filter Media Storm

Benefits

- Light weight (0,7 kg/l) for ease of transport
- Filtration of suspended solids
- Sorption of dissolved pollutants
- High surface area
- Resistant to de-icing salts
- Sustainable: Partially made from waste materials
- Low cost
- Can be located after ACO sedimentation solutions to prolong filter lifetime



The **ACO system chain** creates drainage solutions for the environmental conditions of tomorrow.





ACOs stormwater filter material

has a well-chosen mixture of granule sizes to increase the design lifetime by making sure trapped sediment is spread evenly through the filter, and not just trapped at the surface!

Filter blocking

In stormwater, the majority of sediment is $<300\mu\text{m}$ and carries up to 80% of the pollution load. This is because pollution binds to the surface of particles, and small particles have a high surface area. Gravity can be used to remove bigger sediment; this is how sedimentation works. However, gravity can't remove small particles. In stormwater, 50% of the sediment is smaller than $63\mu\text{m}$ and must be removed using filtration. As stormwater flows through the pores in granular filter materials, multiple filtration mechanisms trap sediment. Sediment then slowly fills the pores, causing the hydraulic resistance to increase, and the flow through the filter to decrease. The filter is blocked when the flow through the filter is lower than the design treatment flow rate. The time it takes for the filter to block is the design lifetime.

ACO Filter Media Storm+

Benefits

- High adsorption capacity
- Suitable for heavily loaded surfaces
- Metal (zinc, copper) roof applications
- Suitable for treatment of heavy metals



Changes in pH

The chemical reactions binding pollutants to a filter's surface are influenced by pH. Importantly, in the acidic range ($\text{pH} < 5$) chemical bonds are disrupted and previously bound pollutants are released back into the water (remobilisation).

ACO Filter Media Storm creates a $\text{pH} > 6$ to make pH dependent reactions safe. It also uses additional non-pH dependent chemical reactions. Together, this limits remobilisation.



De-icing salts

are used in cold conditions and are washed away with stormwater. This creates a challenge for filter materials, as de-icing salts can disrupt the chemical bonds holding pollutants in the filter. Pollution can be released back into treated stormwater if salt concentrations are high! ACO Filter Media Storm uses a mixture of three different materials with different chemical bonds to make sure this doesn't happen.

ACO Filter Media Storm is safe to use with de-icing salts.



ACO Filter Media Storm is **an ideal mixture of different raw materials** where one materials weakness is balanced out by another materials strength. This ensures a long and effective design lifetime!

Material Properties

Appearance	A mix of white, grey/blue, and red/brown granules of variable shape
Grain size	0,5 mm to 5 mm
Porosity	~37%
Bulk density*	~0,7 kg/L

* Loose fill

ACO Filter Media Storm utilizes a mixture of chemisorption and precipitation reactions to achieve **heavy metal adsorption**.

Sorption and Filtration Capacities*

Zinc (Zn)	21,2 g/kg
Copper (Cu)	34,5 g/kg
TSS (d50 = 63µm) for 50 cm head loss	160 g/kg
Bulk density*	~0,7 kg/L

* Under ideal conditions. The presence of competing ions may reduce loading capacity.

ACO Filter Media Storm is intended for use as a **reactive filtration media** for decentralized stormwater treatment. The filter can be operated either in an up flow or down flow configuration.

Conditions for Application

pH range	5 to 10
Minimum filter bed height	0,15 m
Typical filter bed height	0,3 m
Filtration velocity	5 to 30 m/h (optimum 10-12 m/h)
Recommended minimum contact time	3 minutes

The **ACO Filter Media Storm** is an essential part of stormwater treatment. Whether used alone or as a part of ACO Stormclean, it helps to improve the quality of water enough that can be reused or infiltrated without causing damage to the environment.

ACO. we care for water



Every ACO product supports
the ACO WaterCycle



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- ACO stormwater management
 - ACO pumping stations
 - ACO oil separators
 - ACO grease separators
 - ACO hydrodynamic separators
 - ACO stormwater filters
 - ACO sedimentation tanks
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Edition 05/2023 – Subject to alterations

