



MICROPLASTIC REMOVAL BY ULTRA MEMBRANE FILTRATION

Sweden Water Research/VA SYD

Treatment of storm water in the REWAISE project

In the Horizon 2020 project REWAISE, an ultra membrane filter pilot is set up at a stormwater pond to test its abilities to clean stormwater. Through collaboration with the FanPLESStic project, the aim is to test the UM filter's performance in removing microplastics. The research focus is to first test the pond water and later the purified water, to be able to evaluate the microplastic reduction in relation to the reduction effect of the pond.

Photo: UFO system for the sampling of microplastics. The samples were prepared at Lund university. Protocols used for sampling and preparation of water samples was provided from Aalborg university

WHAT IS MICROPLASTICS?

Marine littering is one of the greatest environmental challenges of our time and plastic is one of the most common types of garbage in the sea. Microplastics are plastic particles that are smaller than 5 mm in size.



Pilot description

The pilot unit uses the membrane process ultrafiltration (UF) for improving stormwater quality. One of the objectives is to test UF for microplastic reduction. For this, a stormwater pond in an urban area of Lund was identified as a suitable test site. The pond contains mainly traffic stormwater and has a water catchment area of 4.3 ha. The test site is located near a residential area with pedestrians and the local tram passing by.

A containerised UF pilot unit was delivered in July 2021, as part of the H2020 project REWAISE. The pilot unit has a submerged membrane area of close to 10 m² suitable for average stormwater purification capacities of 300 – 1000 l/h.. The membranes selected for the initial testing are ceramic membranes (Liqtech, Denmark) with a nominal pore size of 0.2 micro. Thus, microplastics and micropollutants with a size larger than 0.2 micron should be removed from the purified stormwater.

Compared to other conventional stormwater treatment techniques like e.g. wet ponds, sand filter or bio filter, the membrane concept is very compact, modular, and continuous concept removing bacteria, micropollutants and microplastic down to the nanometers without filter aids.

Preparing samples

Testing has started with a microplastic analysis of the stormwater. Five water samples from the pond using the UFO for microplastic quantity has been prepared by Lund University and will be sent to Aalborg University for analysis. The pilot unit has some initial start-up problems and has not yet been tested and optimised with regards to operation. Therefore, the samples from the purified water have not yet been analyzed. The REWAISE project and Lund University are working on a solution and a back-up plan to get the samples ready as soon as possible.

Read more: www.rewaise.eu

FANPLESSTIC-SEA

This fact sheet has been produced within FanPLESStic-sea, a project working with preventing and decreasing the pollution of microplastics in the water and the Baltic Sea.

Project period: Jan 2019 - Dec 2021

Total project budget: 3 m. euro

Partners: Aalborg University, Natural Resources Institute Finland (LUKE), HELCOM, Latvian Institute of Aquatic Ecology, SCICC, SALT, Gdansk Water Utilities Ltd, Gdansk Water Ltd, ECAT-Kaliningrad, Luleå Tekniska Universitet, Sweden Water Research

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