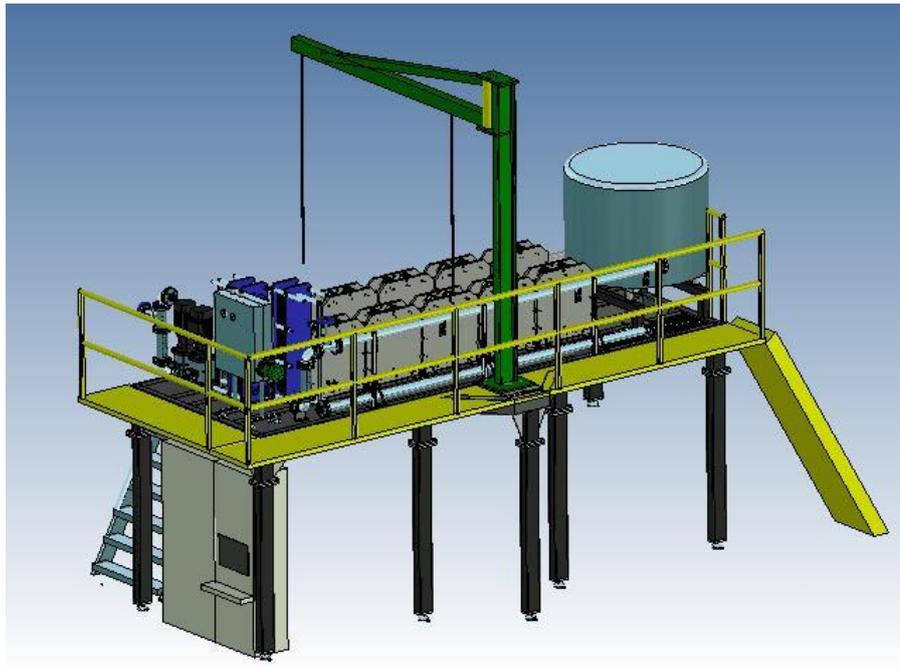


Membrane distillation for treatment of effluents and production of clean water

Membrandestillation för uppkoncentrering/rening av olika vattenströmmar



Collaboration partners

Xzero, Hammarby Sjöstadsverk, IVL- Swedish Environmental Research Institute, KTH – Royal Institute of Technology

Summary

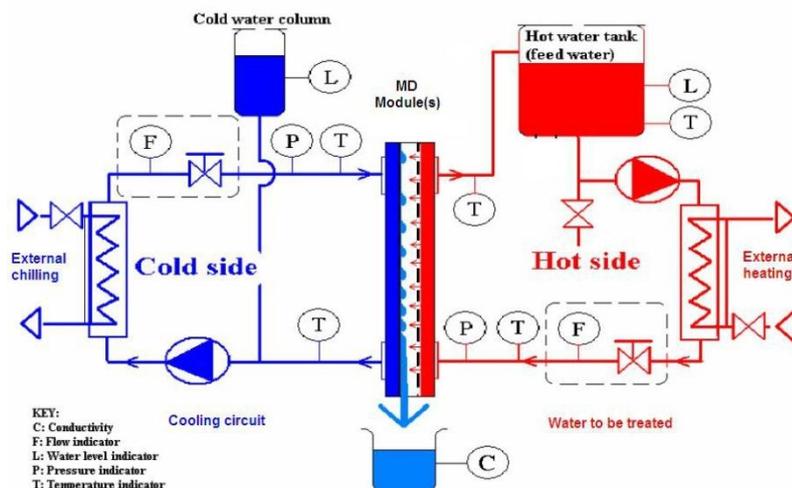
Membrane distillation is a separation technology with interesting properties. The achievable high water quality is one of its advantages. As a high amount of energy as heat is needed to drive the process, waste heat or renewable energy sources are preferred.

The technology is tested, further developed and demonstrated at Hammarby Sjöstadsverk as a cooperation project between IVL and Xzero, the equipment supplier. The project includes testing of different applications for cleaning of contaminated water as well as production of clean water. It might be used for tertiary treatment after biological wastewater treatment. The testing and demonstration will be used to identify optimisation potential concerning energy efficiency, process performance, and treatment results.

Description

Today many countries struggle with water related problems as contaminated groundwater, pharmaceuticals in treated sewage water, complicated industrial wastewaters etc. Existing separation technologies often have problems to treat these wastewaters efficiently.

Membrane distillation is a promising technology for separation and concentration of water. A main difference compared to other separation technologies like Reverse Osmosis is that the driving force is a temperature difference on the two sides of the membrane. This makes it very usable for applying waste heat. Very clean water can be achieved. The scheme below illustrates the working principle of membrane distillation.



Goal

The project aims to show if membrane distillation can replace or complete existing separation technologies that are used today for treatment of water streams. It will be tested for water streams where concentration of contaminated water is a goal as well as for water with the goal to achieve a clean product.

Another goal is to evaluate the technology in order to allow optimisation as well as to show advantages and disadvantages from a life-cycle perspective.

Expected benefit

The expected benefit is that better information is provided to show, which potential membrane distillation has as alternative or complement to existing separation technologies from a technical and system perspective.

If the results are sufficient and are achieved cost-efficiently, MD might improve treatment of some municipal water streams, e.g. with regards, to pharmaceuticals. Other applications might be industrial wastewater or water from desalting equipment.

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