

POREX® Tubular Membrane Filter Modules for Metals Precipitation / Removal

Choosing Tubular Membrane Filter Modules (TMF) for Metals Precipitation/Removal

Industrial processes can often result in waste water contaminated with heavy metals that require treatment prior to discharge or recycling. A treatment system using POREX Tubular Membrane Filter Modules in combination with chemical precipitation provides excellent reduction of heavy metals (nickel, zinc, copper, lead, chromium, etc). TMF product water (permeate or filtrate) is ready

for either disposal into existing municipal waste systems or further treatment for plant reuse/recycle. Treated effluent levels of less than 1 ppm suspended solids and less than 0.1 ppm metals are typical. Cleaning of the TMF modules is simple and involves the use of standard chemicals which will allow many years of service.

Designing a TMF system for a Metals Precipitation/Removal Process

Figure 1 shows a typical Metals Precipitation application with a TMF process. The feed water containing dissolved metals is fed to reaction tank #1 where chemicals are added to enhance metals precipitation out of solution. The water is then fed to reaction tank #2 where additional chemical are added to control pH and further enhance precipitation and the formation of solids. The water is then sent to a concentration tank to be treated by the TMF system. The concentrate is recycled up stream of the Tubular Membrane Filter Modules at the Concentration Tank for re-dilution. Solids concentration is kept at 3-5% with the excess solids sent to a

filter press for de-wetting or to disposal. The number of Tubular Membrane Filter Modules required is dependent upon the total flow rate of the system needed and the modules are typically placed in series of up to 12 modules. Systems are designed to allow at least one train or series of modules to be available for further cleaning if required. It is always best to run a small pilot test system as a means of determining the ideal flux rates through the modules and identify any issues, such as colloids, that might require further module cleaning.

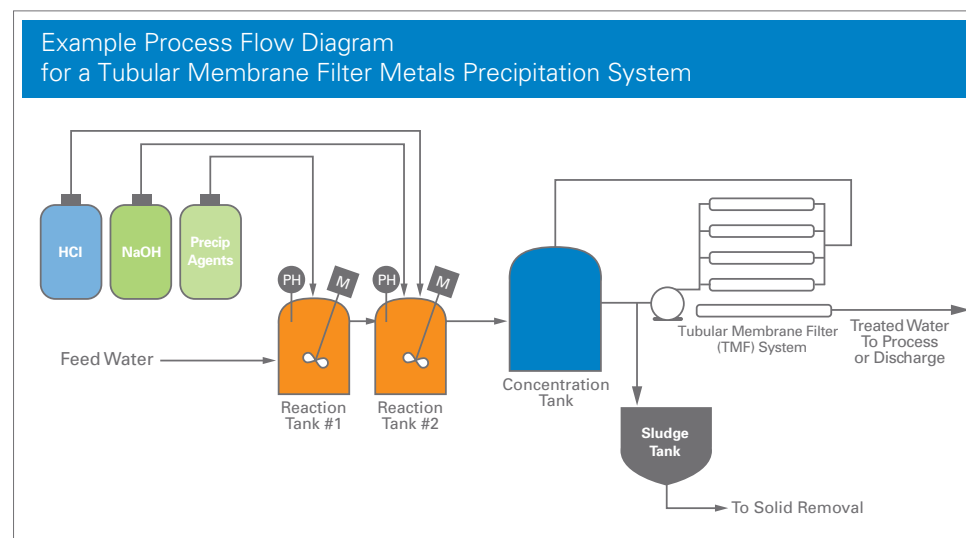


Figure 1 – Example Process Flow Diagram for a TMF Metals Precipitation/Removal System

▶ POREX® Tubular Membrane Filter Modules for Metals Precipitation / Removal

How long will TMF modules last?

The typical lifespan of a Tubular Membrane Filter Module is 3 to 5 years or longer with the total TMF system designed for approximately 20 years of operation. The PVDF membranes and the PE or PVDF substrates used in the Tubular Membrane Filter Modules are extremely robust. They are designed to withstand harsh environments and will resist abrasion, high temperature, and pH environments from 0-14 without a decrease in retention efficiency.

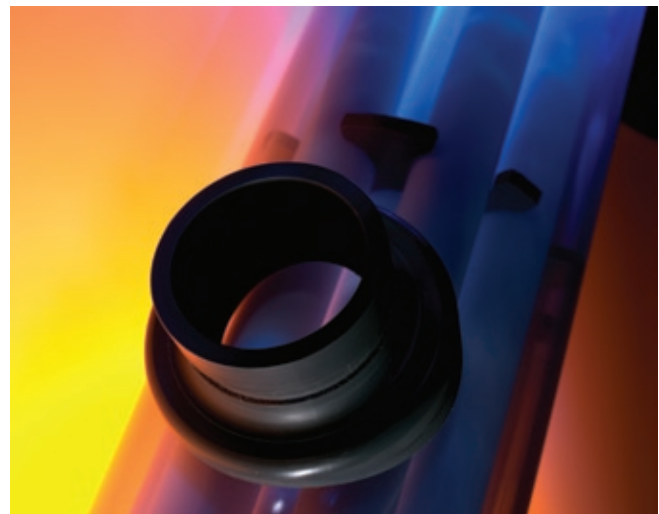
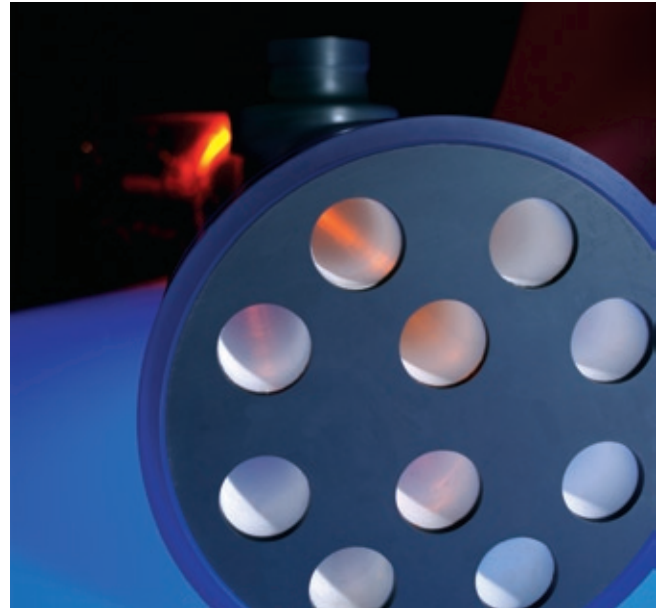
Summary

Tubular Microfiltration or Ultrafiltration systems using POREX Tubular Membrane Filter Modules offer:

- Easy operation, maintenance and control
- Continuous operation and performance
- Resistance to abrasion and temperature fluctuations
- High flux rates

Metals Precipitation/Removal, with a Tubular Membrane Filter Module (TMF) system will yield a significant process improvement, offering a compact (smaller footprint) and efficient alternative to bulky precipitator-clarifiers that are sensitive to temperature changes.

Tubular Membrane Filter Modules, which can handle high solids concentrations, also provide a cost effective alternative to other membrane based technologies that are challenged by high solids levels.



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