

Product Bulletin

DF-18-MD

Energy Saving Membrane System

Challenge

Since its inception in the water & wastewater industry, the tubular cross-flow PVDF microfiltration (MF) technology has gained global acceptance in various critical effluent compliance and water recycle roles due to its high solid tolerance, strong chemical resistance and high flux performance. In a MF filtration operation, chemically pretreated wastewater is pumped and re-circulated through multiple rows or trains of membrane modules that are connected in series. A typical membrane train consists of 10 to 12 modules operated with an inlet and outlet pressure of about 50 and 20 psi, respectively. The energy consumption per unit volume of filtrate produced will depend on the operating pressure and number of modules on a train, which is often limited by the mechanical strength of the membrane. As energy shortage continues to prevail, the ever-increasing energy cost has become the main driver for achieving economical water purification and recycle with energy-efficient equipment and design.

Duraflow MF System



Solution



Duraflow MF
10-Tube Modules

The re-circulation rate through each membrane train is a pre-determined constant. A velocity of 12 – 15 feet per second is maintained to ensure a dynamic turbulent condition inside the tubes. To maximize the value of energy applied to the re-circulation operation, a longer train with more modules operated with the same transmembrane pressure can increase the output volume and decrease the energy consumption rate (kilowatt/filtrate output). After years of laboratory research and field testing, Duraflow has developed and commercialized a new generation module with physical capability to withstand higher operating pressure. With the new improved modules, a train assembly can be built to accommodate up to 18 modules. The extended train operated at an elevated pressure of 60 psi results in the following cost savings and benefits. The saving or reduction indicated is relative to the conventional design.

- Energy saving (25% less)
- Capital cost reduction
- System foot print reduction
- Cost-competitive for high flow applications
- Installation simplification
- O&M cost reduction

System Configuration

Configuration	Membrane Area (ft ²)	Rated Capacity (GPM)
1 Train – 18 Modules	270	90
2 Train – 36 Modules	540	180
3 Train – 54 Modules	810	270
4 Train – 72 Modules	1080	360
5 Train – 90 Modules	1350	450
6 Train – 108 Modules	1620	540