

Envopur® spiral-wound membrane elements with new type of spacer (tubular spacer)

EnviroChemie GmbH, 64380 Rossdorf, Germany
 Dr. Markus Engelhart
 markus.engelhart@envirochemie.com, phone: +49 6154 6998 57

BACKGROUND

Membrane processes have become a standard operation in production of drinking water and in the treatment of wastewater. Commonly spiral wound membrane elements are applied for nanofiltration and reverse osmosis because of compact design and economic considerations. Applicability of spiral wound elements however is often limited to solid free liquids since feed channels and spacers tend to get blocked by colloidal and / or suspended particles.

TECHNOLOGY

The tubular spacer technology joins economics of spiral-wound elements and free flow of capillary elements. The tubular feed spacer forms free flow channels within the element without any obstruction because of ligaments across the direction of flow (unlike parallel spacers or diamond spacers). Tubular spacers are made by thermoplastic forming. Width of spacer may be varied according to specifications up to 50 mil. Tubular spacers may be introduced in 4" and 8" spiral wound elements, compatible to conventional equipment in UF, NF and RO treatment. Tubular spacers may be favourably used for filtration of complex heterogeneous wastewaters which tend to form precipitates or agglomerates during concentration of the feed.



Figure 2.- Cross sectional view of 4inch element with tubular spacer

ADVANTAGES

- Beneficial combination of properties of spiral wound and capillary membrane elements
- Interchangeable with conventional spiral wound elements
- Improved tolerance towards colloidal and suspended organic matter

APPLICATION

Industrial wastewater (paper industry, surface refinement, photovoltaic's...), leachate treatment, acid filtration.

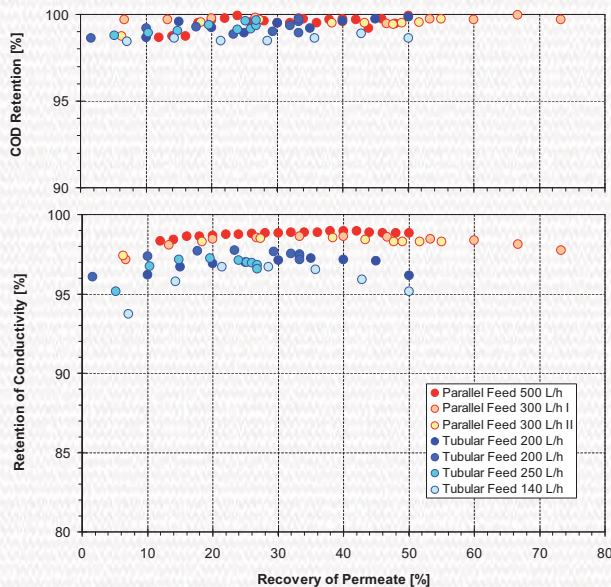


Figure 1.- Comparison of results with secondary effluent of a paper mill.



Figure 3.- View of unit for pilot tests