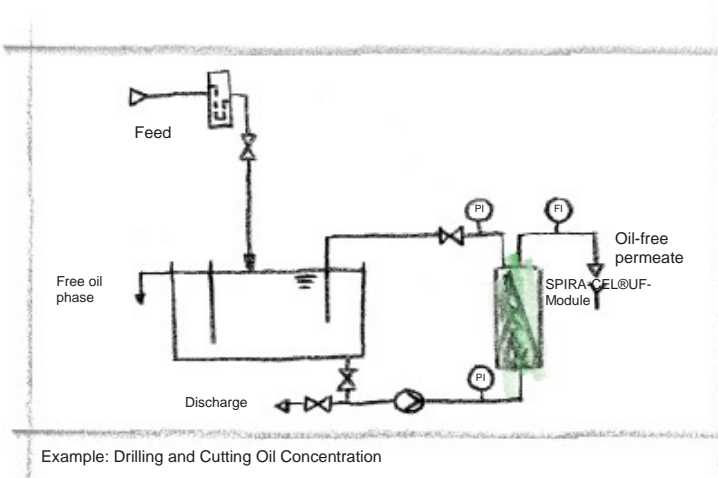


Membrane Products for Treatment of Oil / Water Emulsions



Example: Drilling and Cutting Oil Concentration

Micro and ultra filtration are widespread processes for treating oil / water emulsions, which are produced as waste water streams in numerous process steps in various areas such as car-wash plants, canteen kitchens, ships and the food industry.

These waste water streams must be purified in accordance with the statutory regulations. Micro and ultrafiltration are used to reliably treat this water by separating emulsified and non-emulsified oils, fats and lipophilic substances, as well as particles and reducing the COD value.

This process results in a low-volume concentrate stream in which this matter accumulates and a filtrate stream, which satisfies the statutory regulations concerning hydrocarbons and lipophilic substances. Furthermore, this filtrate, with its distinctly reduced COD value, can be further treated using nanofiltration or reverse osmosis.

In addition to the filtrate, which conforms to the statutory regulations and can be discharged without causing additional tasks, there is also a potential to save on the concentrate disposal.

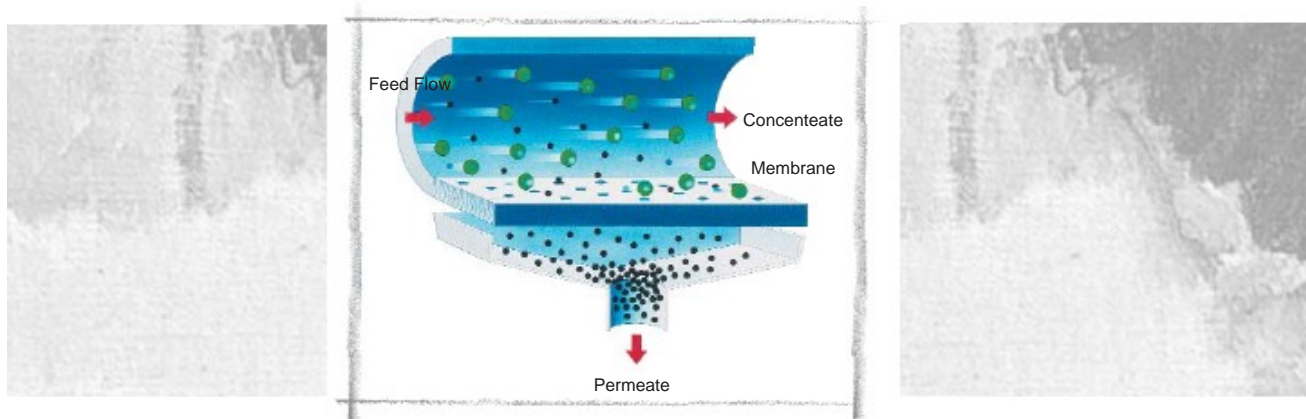
Since membrane technology is a purely physical process where chemicals are used only in the membrane cleaning process, it is a particularly environmentally friendly and resource saving solution for treating waste water streams. This method satisfies modern concerns for environmental protection.

This procedure makes special demands on the membrane and the module regarding the stability, flux rate and rejection.

Because of the high membrane and module stability, both SPIRA-CEL® spiral wound modules and MICRODYN® tubular and hollow fibre modules have proven their worth in this application field. Membranes made from Polyethersulfone are particularly effective where the cleaning process or the operational parameters make high demands on the chemical, temperature and pH stability. In applications with less extreme requirements, membranes made from regenerated cellulose demonstrate superior cleaning, performance and lifetime behaviour due to their outstanding hydrophilicity, and ensure the efficiency of the process.

The wide range of available membrane and module types made of different polymers ensures that the modules can be perfectly configured to suit the processes and separation tasks to optimise the capacity and efficiency of the process.

Characteristics of Cross-Flow Filtration



In cross-flow filtration, the process flow is pumped parallel to the membrane. This concept promotes mixing of the process flow during filtration and counters the accumulation of particles and molecules on the membrane surface. Particles that are deposited on the membrane surface are largely flushed away.

This is the reason why cross-flow filtration allows for stable flow rates through the membrane over long periods of time, even for media that are difficult to filter.

Overall, the prevention of the formation of a fouling layer and the better mixing of the process flow allow for a larger throughput and a more stable process than could be achieved with conventional filtration.

When performing cross-flow filtration on a particular liquid, the effect is significantly influenced by the choice of membrane, the module geometry (respectively the module design) as well as by the main process parameters pressure and cross flow velocity at the membrane surface. The process performance furthermore depends on many different factors.

MICRODYN-NADIR has long experience with the assessment of these influencing factors for optimizing membrane separation processes.



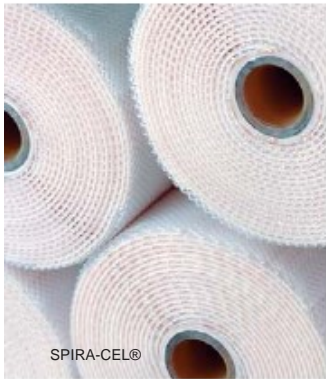
A new Generation of Membrane Products

Our new generation of membranes and elements for micro, ultra and nanofiltration provides increased productivity and stability.

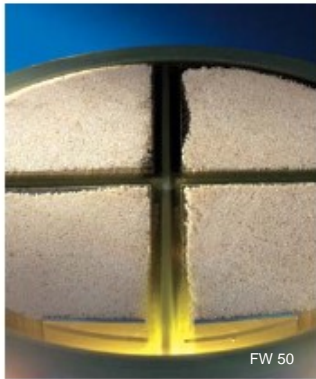
Our membranes are available in roll stock, flat sheet, die-cuts, spirals, cassettes, hollow fibers cartridges and tubular configuration and a wide range of standardized or customized modules depending on the required membrane material and molecular weight cut-off (MWCO).

Modules are available in sanitary and industrial versions for high temperature and high pH conditions.

We support our customers in the development of processes by providing these services and with decades of know-how from the chemical industry (Hoechst AG, Akzo AG). Moreover, we are able to offer the shortest possible delivery times, irrespective of the order volume.



SPIRA-CEL®



FW 50



Application	Properties	Advantage
Biomass separation	Retention of the biomass, germ reduction	Water recycling, efficiency increase, compliance with statutory regulations
Drinking water treatment	Separation of germs and colloids	High operational safety, high efficiency
Filtration of gravel filter backwash water	Separation of cloudy material, colloids and germs	Water recycling, efficiency increase, cost saving
Waste water from car-wash plants	Separation of oil, colloids and particles	Water recycling, cost saving
Treatment of bilge water	Removal of oil and particles	Volume reduction, compliance with statutory regulations
Waste water from canteen kitchens	Separation of lipophilic substances	Savings on waste water taxes, compliance with statutory regulations
Dairy waste water	Separation of lipophilic substances	Savings on waste water taxes, compliance with statutory regulations
Waste water from the cosmetic industry	Separation of fats, COD reduction	Savings on waste water taxes, compliance with statutory regulations
Treatment of detergent solutions	Separation of particles and fats, COD reduction	Recycling, savings on waste water taxes and fresh water usage