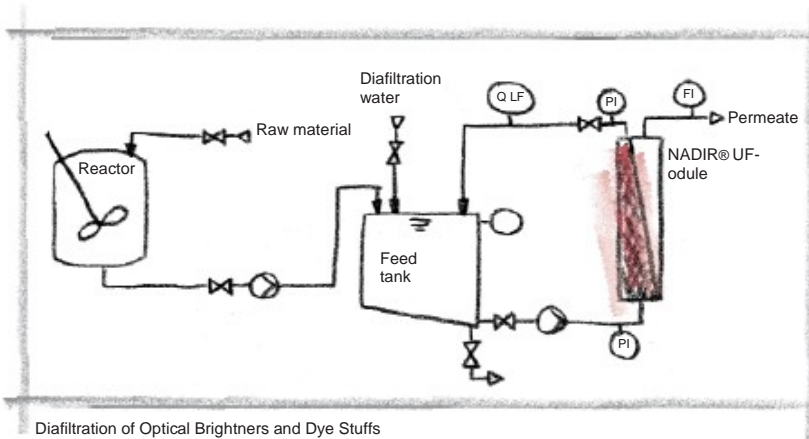


# Membrane Products for Diafiltration in the Chemical Industry



Diafiltration of Optical Brighteners and Dye Stuffs

The process of diafiltration is widely used in the chemical industry for separating salts and acids from aqueous reaction mixtures.

The salts and acids made during the production of reactive dyestuff and optical brightening agents are separated from the reaction mixture and the reaction product is then concentrated.

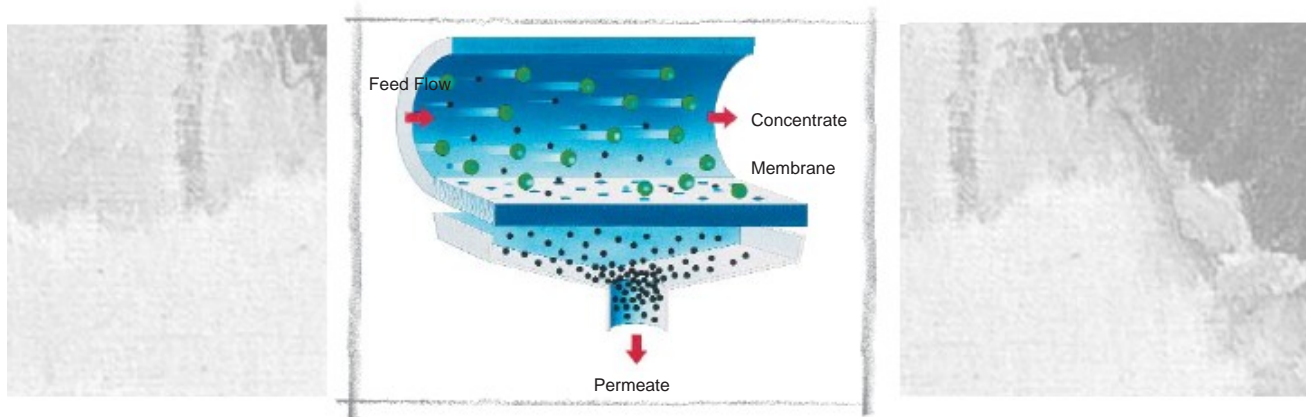
This procedural step makes especially high demands on the membrane and the module regarding the pH and temperature stability, the flux rate and the rejection of solids.

Because of the high membrane and module stability, SPIRA-CEL® spiral wound modules have also proved their worth in this application field. Due to permanent hydrophilicity, these modules allow you to achieve high flux rates and high retention values even at low molecular weight cut offs.

In the production of optical brightening agents, excessive cooling of the reaction mixture down to below 50°C is no longer necessary for diafiltration. With the use of MICRODYN-NADIR modules, this procedural step can be performed at 80°C.

Additionally, various different membrane and spacer types allow for an optimal adjustment of the modules to the particular process, so that the processes can be carried out with high economic efficiency.

# 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.

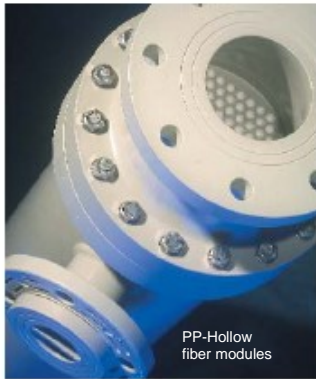
Depending on the demands made on the membrane material and on the molecular weight cut off, the membranes can be supplied in the form of rolls, die-cut formats, hollow fiber modules, tubular modules or spiral wound modules. Our products are available in standard as well as in customer-specific designs. We also provide sanitary-purpose modules for high temperatures and high as well as low pH-values.

Our main focus, starting from the design and continuing through to the manufacture of our products, is to provide operational safety for your industrial production process.

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®



PP-Hollow fiber modules



Application	Process	Advantage
Treatment of process flows in general	Concentration and fractionation	Lower energy consumption than e.g. evaporation or rectification
Separation of catalysts	Clarification	Catalyst-free product, catalyst recovery
Dye desalting	Desalting	Chemical-free process, high product quality
Latex concentration	Product concentration after polymerization	Energy-saving in comparison to distillation/rectification
Treatment of developers and fixing baths	Concentration and fractionation	Volume reduction and recovery
Desalting of optical brightening agents	Diafiltration	Chemical-free process, high product quality
Acid/base recycling	Treatment, removal of multivalent ions	Product free from solids; depletion e.g. of metals; recycling
Separation of suspended matter from heterogeneous reactions	Clarification	Separation of undesired by-products
Concentration after diafiltration	Concentration	Volume reduction