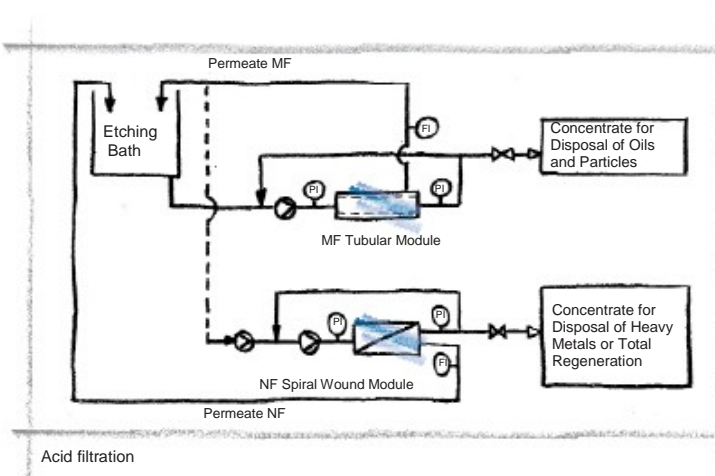


# Membrane Products for Acid Filtration in the Manufacture and Processing of Steel



Acid filtration

The separation of particles and heavy metals from process solutions achieved efficiently by use of Micro and nanofiltration technologies.

In the process of Etching, particles, oils, fats and heavy metals accumulate in the etching solution, which decreases in etching capacity and lifetime, thus reducing its availability.

Etching is an important process in the manufacture of both carbon steel and stainless steel.

With the help of microfiltration, the particles, oils, fats and colloids are concentrated in a partial stream of the etching solution. The purified filtrate resulting from this process is returned to the etching solution, so that the concentration of the named substances remains at a constantly low level in the etching bath.

In a further filtration step, the heavy metal content for stainless steel etching is specially lowered in the etching solution using nanofiltration.

This process improves the availability of the etching solution and the sustainable achievable quality of the etching process. Furthermore, the costs for the total regeneration of the etching solution are lowered.

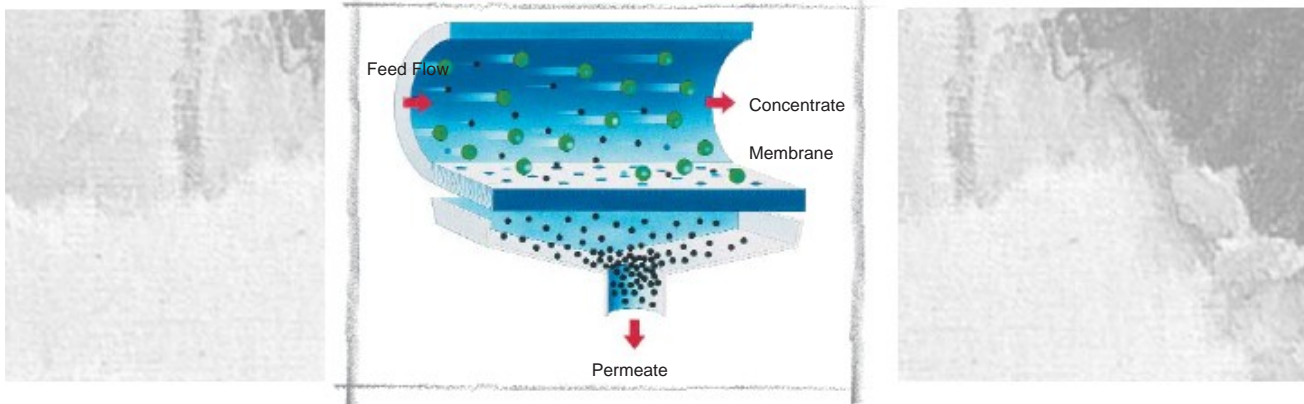
This procedural step makes especially high demands on the membrane and the module regarding the pH and temperature stability, the flux rate and the rejection.

Because of the high membrane and module stability, both MICRODYN® tubular modules and SPIRA-CEL® spiral wound modules have also proved their worth in this application field. The basic advantage such modules are extreme acidic stability under extreme conditions, high flux rates and high separation efficiency.

When employed in stainless steel etching with oxidizing nitric acid or hydrogen peroxide, the products distinguish themselves through outstanding stability performance and also allow economical use in this field.

The wide range of available membrane and module types ensure that the modules can be perfectly configured to suit the processes, so that optimal results can be achieved concerning flow rate and 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.

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.

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

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-CELSPIRA-CEL®



PP Module



Application	Properties	Advantage
Treatment of carbon etching	Separation of oil, colloids and particles	Lifetime extensions, cost saving
Treatment of stainless steel etching	Removal of heavy metals	Lifetime extensions, increased quality, cost saving
Separation of oil/water emulsions	Concentration of oil	Volume reduction, cost saving
Treatment of electroplating waste water	Separation of heavy metals	Minimisation of the disposal volumes, water recycling
Degreasing bath maintenance	Separation of oils	Lifetime extensions, increased quality, disposal cost saving
Grinding water recycling	Separation of particles	Quality improvement, matter recycling
Cooling lubricant treatment	Concentration of oil	Volume reduction, disposal cost saving
Phosphating bath maintenance	Separation of particles and oils	Lifetime extensions, quality improvement