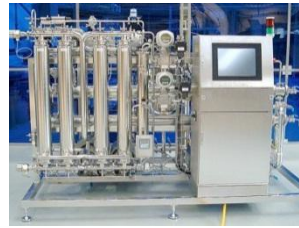


# Process Development

*“Technology Innovation”*

„Essential Partners in Membrane Technology“



## Process Development Approach

MMS specializes in development of membrane processes for food, pharmaceutical and water industries. The goal of the MMS process development is to allow our customers to establish the following parameters:

- Technical feasibility of membrane technology
- Optimum membranes, operating parameters and system configuration
- Cost of an industrial solution

„From Sample to Process“

### Step 1 - Process Evaluation

- Initial evaluation of the process
- Product inspection and chemical analysis
- Pretreatment test (centrifuge, sieves, prefilters)
- **Solution proposal.** MMS will propose a trial program for your process.

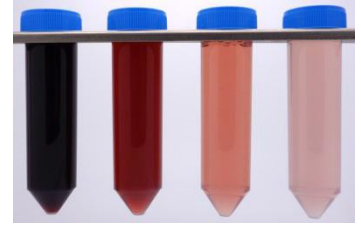
### Step 2 - Lab Test

- **Trial tests of your product** on various membranes
- Selection of the most suitable membranes for your process (cut-off, material) and investigation of flux, VCR and rejection as well as fouling and cleanability
- Optimization of the process parameters: temperature, pressure, crossflow, pH
- The resulting test samples can be sent back to you for more in-house analytics
- Budget proposal

### Step 3 - Piloting

- **Pilot tests** of your process with the rental systems in-house or on-site.
- Scale-up and evaluation of the lab results or test production
- Start-up and process support by MMS process engineer
- Support in cleaning and storage of the membranes
- Simulation of an industrial process: mass balance, simulation tools and cost estimate

„Essential Partners in Membrane Technology“



## Process Development Capabilities

### Membranes & Modules:

- More than 120 membranes and modules in stock (flat sheet, spiral wound, ceramic, hollow fiber and tubular)
- Support in membrane selection
- Membrane database and characterization by internal standards
- Membrane know-how of more than 250 tested applications



### From Laboratory to Pilot Units:

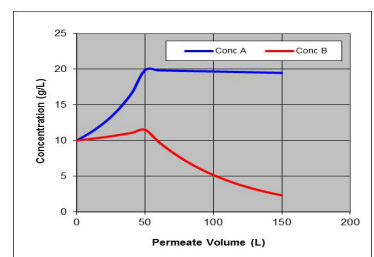
MMS offers a wide range of filtration systems for MF, UF, NF and RO up to 40 (60) bar :

- Laboratory systems from 0.1 – 1 l
- Bench systems from 2 – 20 l
- Pilot systems from 20 – 10 000 l
- Rental systems for trials on customer side and test production in all sizes available



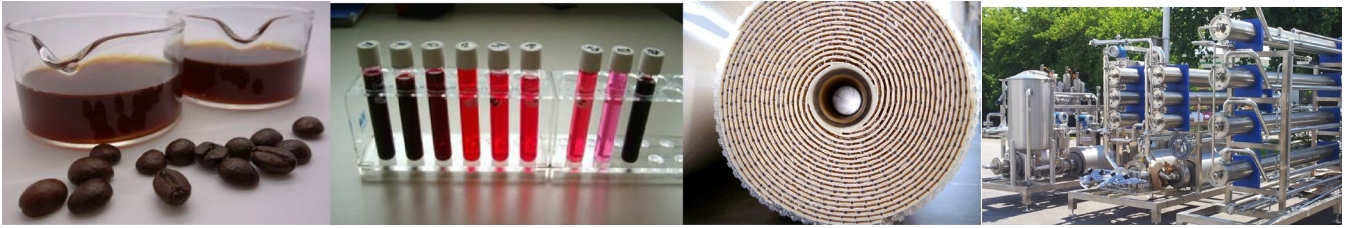
### Process Development Service:

- Membrane screenings for evaluation of membrane technology
- Piloting for scale-Up evaluation and test production
- Process and CIP optimization
- Simulation of industrial processes by MMS simulation software
- Cost calculation (CAPEX/OPEX) of industrial systems
- Training and process support
- Sample preparation and analytics



*„Essential Partners in Membrane Technology“*

**MMS**  
Membrane Systems



## Your Benefits

### Membrane and Application Know-How:

- 20 years of membrane process know-how
- Over 100 industrial systems installed
- Over 250 applications developed
- Continuous research into new applications



### Efficient Development Process:

- Membrane process development by specialist
- Rapid development within days
- No investment in hardware and training



*„Send us a Sample – expect more“*



**MMS AG Membrane Systems**  
Im Grossherweg 11  
8902 Urdorf  
Switzerland

T: +41 44 735 59 00  
F: +41 44 735 59 01  
[info@mmsx.com](mailto:info@mmsx.com)  
[www.mmsx.com](http://www.mmsx.com)

