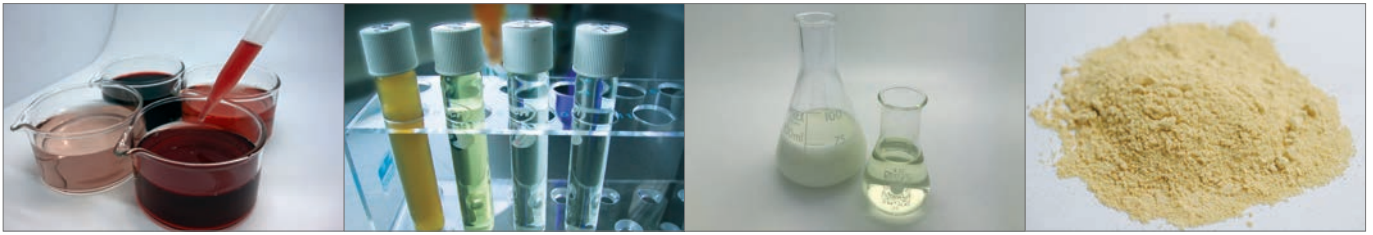


MEMBRANE TECHNOLOGY FOR

# BIO-PHARMA APPLICATIONS

# MEMBRANE FILTRATION FOR



## MMS Filtration Solutions for the Bio-Pharma Industry

For more than 25 years MMS has developed membrane solutions for several industries, including the bio-pharma sector. We apply the latest membrane filtration technology to enable our customers to clarify, fractionate or concentrate their liquid solutions.

The bio-pharma industry demands high quality standards in documentation, system design, and construction. MMS system design and construction matches all quality requirements, and we work closely with our customers in order to meet the expectations in design, function, and documentation.

MMS bio-pharma membrane systems are fully documented with all required drawings, material, welding and calibration certificates.



### Microfiltration

Fermentation broth clarification or harvesting allows a clear physical fractionation of cells and cell debris. With diafiltration, microfiltration will allow for high yields of product and high purity.

MMS has experience and applications with both polymeric and ceramic membranes, and from small to larger volumes.

### Ultrafiltration

Ultrafiltration can be used to either concentrate your target enzyme, protein, or macro-molecule, or to further purify your smaller target compounds.

MMS has experience and applications with both polymeric and ceramic membranes, from small to larger volumes as well as ATEX installations, which can handle corrosive solutions.

### Reverse Osmosis

Reverse Osmosis is used for concentration of small molecules or for the purification of water.



# BIO-PHARMA APPLICATIONS



## Nanofiltration

Nanofiltration can be used to concentrate or purify peptides, API, sugars, vitamins, or salts.

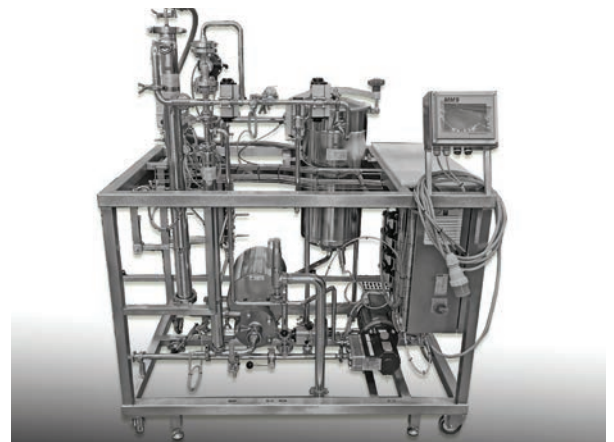
With pore sizes from 150 – 1000 Da, a large application base is available.

MMS has extensive experience in high pressure nanofiltration applications, both with spiral wound modules and ceramic elements.

## Pilot Systems & Process Development

Over the last 25 years MMS has developed a comprehensive range of pilot systems for purchase and rent to allow our customers to test our solutions.

MMS supports our customers with process development, through a dedicated membrane laboratory in Zurich or on-site whilst we train you on our pilot units. Please refer to our leaflets on Lab & Pilot Systems and Process Development Service for more information.



## Bio-Pharma Industry Membrane Filtration Applications

APPLICATION	PROCESS	BENEFITS
Fermentation broth clarification & concentration	MF/UF	Clarification with high purity and yields
Protein concentration	UF	Concentration of proteins with diafiltration
Enzyme concentration	UF	Concentration of proteins with diafiltration
Peptide concentration & de-salting	NF	Ceramic NF for peptide concentration & purification in solvent solutions
API purification & de-salting	NF	Polymeric NF for API concentration and purification in aqueous solutions
Oligosaccharide purification & concentration	NF	Open NF allows for sugars to be fractionated without the need for chromatography
Solvent recovery or exchange	NF	Removal of impurities using nanofiltration
Removal of wastewater contaminants	UF/RO	Toxins and contaminants can be removed from water by RO



## Why choose MMS

- We offer solutions and guidance for all stages from development through pilot trials to full-scale systems.
- We understand the technology and processes and match them to your needs and requirements.
- We have more than 25 years of experience.
- We are open to new ideas and opportunities.
- We are easy to communicate with in all respects.
- We innovate based on customer challenges and cross-industry experience.
- We are independent and do not represent any specific manufacturers

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