

# Messinger Membrane Systems AG

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## MMS in Brief

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**Abstract:** In the design of bioseparation processes, it is necessary to harmonize the results of laboratory and pilot development work with engineering aspects at a very early stage of development. The early work of such process development defines the overall economics of a manufacturing process. A biochemically oriented development of downstream processing must – from the beginning – be linked to industrial reality. Industrial reality means that the plant engineer is limited to predesigned devices such as pumps, valves, piping diameters, etc., whereas the process designer can optimize the process within a much broader range of parameters. Problems arise when a multistep serial operation, such as downstream processing of biopharmaceuticals, is calculated by single laboratory and pilot scale tests but then, often too late, translated or integrated into a continuous operated system. MMS offers equipment and techniques to develop novel multistep processes at the molecular level for industrial dimensions.

**Keywords:** Downstream processing · Messinger Membrane Systems AG · Microfiltration · Reverse osmosis · Scaling up · Ultrafiltration

Messinger Membrane Systems AG (MMS) is a growth company providing core capabilities, based on membrane technology, that enable the food, biotechnology, and pharmaceutical industry to set up new industrial processes and products. MMS provides novel processes for the separation, fractionation, purification or isolation of all classes of molecules within the life sciences.

Membranes enable filtration to be extended to separations of colloids, cells, and molecules by microfiltration, ultrafiltration, nanofiltration, reverse osmosis, and various other membrane-related technologies such as pervaporation, electrodialysis, affinity ultrafiltration etc. MMS does not manufacture membranes but delivers a solution of ultimate performance by custom-designed and manufactured robust high-throughput systems, continuously separating molecules at an industrial scale.

MMS was founded in 1995. Within a few years of operation, MMS has set up an excellent infrastructure (laboratory, assembling plant, construction, engineering) unique products and very good customer relationships.

During 1998, MMS started developing a technology for integrated downstream processing systems (DSP). These machines undertake several complex steps simultaneously and in a continuous mode of operation (no batch processing). The demand for such systems is enormous and the long-term outlook offers exciting growth potential.

What is needed are manufacturing processes that can respond to the need for a

variety of customized features. Faster than the conventional accelerated time-to-market approach by scaling up from the lab to the factory, development work is undertaken on down-scaled micro-units by a diversified team of scientists, process developers and practiced commissioning engineers. In addition, low-yielding laboratory processes make it very difficult for a company to produce enough material to supply clinical trials or representative samples in a timely fashion. MMS has bench-scale and laboratory units to enable small-scale production.

Permanent development within MMS has led not only to new applications, but also to the integration of such applications into novel system architectures. We focus on individual process development but try to realize them on standardized platforms. We pursue a policy of diversification in process varieties but unification in system design. However, customized systems will be designed whenever required.

Extending membrane technology to state-of-the-art down-stream-processing plants involves bringing together, in a single coherent package, all of the attributes needed for delivering the benefits that our customers expect.

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Fig. MMS production system

Our customers are interested not only in the solution, but in the feasibility, costs, speed of realization and consequences of a novel process. Investigating their products on a molecular level usually means tolerating very long and expensive evaluations. MMS can shorten the evaluation time of novel processes. Nobody can inform the decision makers better than the product itself. A sample says more than a dozen reports. It is the best piece of communication. Therefore we say: 'send us a sample, we return the process'. By this we mean you will receive your processed sample together with enough data to have a first cost- and performance check at hand. Your process starts with us. MMS has many membranes for screening on stock. We do not represent any manufacturer but use membranes of excellent membrane manufacturers world-wide. Our purpose is clear: to enable the processes of our customers. We therefore design according to *their* needs.

MMS today offers complete packages, and can deliver industrial turn-key systems incorporating unique modules, hardware devices and processing strategies to boost all life-sciences industries.

The systems not only compete with traditional separation technologies in terms of achievable separation, concentration, energy- and space requirements, but couple high-performance with cost-parity, including all necessary technology-based services, are easy to operate, and are used to deliver unmatched quality.

MMS has defined most of the critical factors that make a successful membrane

process and/or membrane plant. Innovative processing tools like membrane systems will create new applications and new markets. Mastering molecular processing means embracing change and implementing fast and accurate new solutions.

Our process designs are mature at the core but novel in their efficiency and performance gains are won from incremental improvements to a basic design. We undertake painstaking development work in our laboratory to ensure a superb full-scale result.

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