

Aeration at its finest!

RUDOLF **MESSNER** UMWELTTECHNIK





”Our thinking and actions are based

The MESSNER Philosophy.

The insights we have gained into the optimal treatment of wastewater in the biological cleaning stage of a wastewater treatment plant are the result of considerations and experiments, which are always carried out by closely following and observing natural laws. Nature is our inspiration, and it only requires very precise observation of the processes that have been in existence for millions of years to understand them, implement them on a technical level and place them at the service of humankind. Our goal is to remain true to this course.

The Company.

RUDOLF MESSNER UMWELTECHNIK AG, headquartered in Adelsdorf, Germany, has established itself over the decades as a successful company in the field of biological process and aeration technology for municipal and industrial wastewater treatment plants.

Aeration at its finest!

Today, efficiency and quality are among the most important characteristics of aeration systems, facilitating the economical and ecological operation of biological wastewater treatment plants. Our aeration system, which represents state of the art technology due to its optimal integration into the cleaning process, is particularly successful in

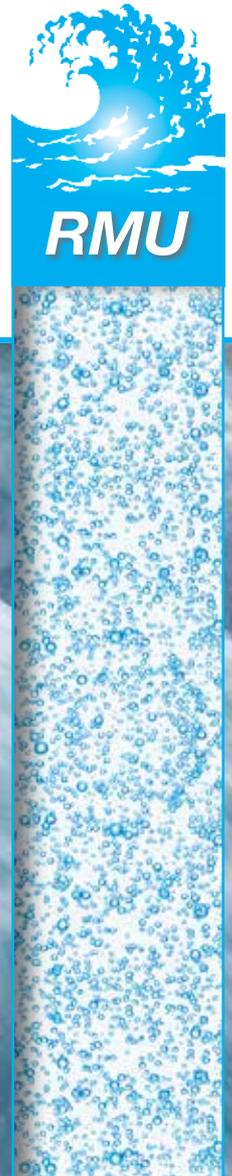
meeting these requirements. It makes absolutely no difference whether the system is aerated on a continuous basis or only operated intermittently. In addition, the tank geometry is only of minor importance for the implementation of the MESSNER Aeration Panel. A suitable solution can be offered for every type of plant. Practical experience with over 1,000 plants, which have now been equipped with the system both in Germany and internationally, provides proof that the MESSNER specialty membrane made from TPU (thermoplastic polyurethane), which is used as the material for the membrane, has an expected operating life of 15 to 20 years. As a result, we have been

setting new standards for service life in the aeration sector for many years. The long-term permanent elasticity of the membrane is a prerequisite for the continuous creation of fine bubbles by the MESSNER Aeration Panel and therefore critical to the expected operating life of the aeration unit.

We regard our main tasks in the field of environmental technology, especially in wastewater technology, as technical consulting, competent planning support, reliable implementation and ongoing customer support in the operation of municipal and industrial wastewater treatment plants.

on the laws of nature.“

Rudolf Messner





The MESSNER Aeration Panel.

The proven MESSNER Aeration Panel, which is equipped with a permanently elastic, low-maintenance, non-clogging membrane of thermoplastic polyurethane (TPU), contains no plasticizers or other additives. It is ideally suited to continuous and intermittent operation in aeration tanks of municipal or industrial wastewater treatment plants.

Technical data:

| | |
|-------------------------------------|-------------------------------------------------|
| Product: | MESSNER Aeration Panel |
| Type: | V20M50 |
| Dimension (L x W): | 2.0 m x 1.0 m |
| Active membrane area: | 2.0 m ² |
| Air flow: | 40 m ³ _N / h per diffuser |
| Max. wastewater temperature: | 30.0 °C (higher temperatures on request) |

Many Convincing Arguments.

The MESSNER Aeration Panel has been used with great success since 1981 as a fine bubble membrane diffuser for the supply of oxygen in municipal and industrial wastewater treatment plants.

High oxygen transfer rate

through the optimal capacity of the permanently elastic membrane to produce fine bubbles and the distribution of the fine bubbles created over a large area.

Best possible oxygen utilization

through maximum depth of entry and extensive coverage directly on the tank floor.

Maximum adaptation of oxygen

to the requirements of the biological treatment unit by continuously variable control of the air flow from 0 to 100%, without the penetration of activated sludge into the diffuser.

Homogeneous mixing

of the activated sludge due to large-area installation close to floor level, without the use of mixers.

High amortization rate

through guaranteed and long-term savings in operating costs.

Reduction in dewatering facilities

through air connection located above the panel, and watertight closing specialty membrane.

Minimal flow resistance

and avoidance of deposits through optimized design and installation directly on the tank floor.

Wide range of application

for both municipal and industrial wastewater due to robust and non-clogging construction.

High operational reliability and stability

through processing of high-quality materials in line with quality requirements, and professional installation.

Minimum maintenance effort

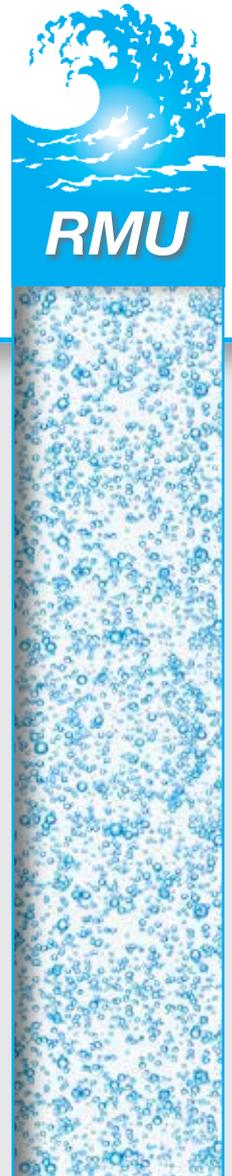
through automated and effective self-cleaning mechanisms of the permanently elastic specialty membrane.

MESSNER Aeration Panel. The Original.

The MESSNER Guarantee.

Due to high-quality materials and sophisticated manufacturing processes in combination with 100% output control, which includes a pressure test with a check on the fine, even bubbles for each individual aeration panel. The expected service life in municipal wastewater of between 15 to 20 years can be achieved and proven through practical experience with many reference plants. As proof of the high quality of the MESSNER Aeration Panel,

we guarantee materials, manufacture and functioning for **5 years**, when used in the treatment of typical municipal wastewater and provided the service and operating conditions are observed. In combination with the guaranteed oxygen transfer rates and oxygen transfer efficiency, this makes a substantial contribution to the reliable operation and high efficiency of sewage treatment plants.



MESSNER Aeration Technology in brief.

MESSNER aeration technology has proven itself for over 30 years in municipal and industrial wastewater treatment plants of varying sizes and under various operating conditions. The main components of the MESSNER aeration technology are the MESSNER Aeration Panels and the related downpipes including ball valve, as well as a pressure relief device. By default, each aeration panel is connected to the above-water air distribution with a separate HD-PE pipe (DN32) via a ball valve, making it possible to shut off and regulate each panel individually.

RMU Plug Flow Technology

Apart from efficient aeration, improved process stability and reduced effluent values are the main requirements when upgrading existing aeration systems. By changing the process technology to intermittent denitrification without mixers and without recirculation, the so-called RMU Plug Flow Technology, these requirements can be met in a particularly effective way.

Process characteristics

This process is distinguished by the fact that mixing devices are not required in the aeration tank to maintain sufficient mixing and velocity on the tank floor. The aeration elements are arranged in the entire aeration tank (plug flow reactor) over a large area and as closely as possible to the floor. They also serve to homogenize the activated sludge during the non-aerated denitrification phase, using the so-called **RMU Air Pulsing**, without disrupting the denitrification process.

Requirements

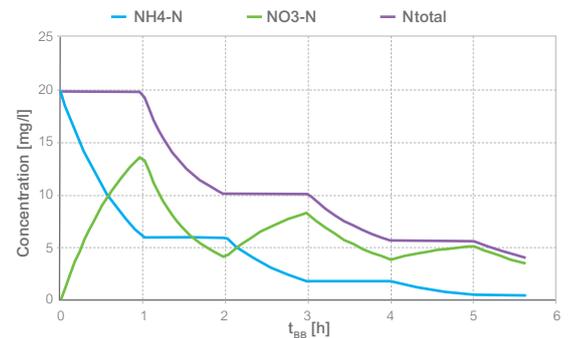
The secure elimination of nitrogen and improved cleaning performance require that the process is converted to include several cycles, each with an aerated phase (nitrification) and a non-aerated phase (denitrification). They are operated intermittently in the plug flow

reactor, without mixers or recirculation. The process is automated on a plant-specific basis with MESSNER control concepts, using modern online sensor technology.

Summary

A wide range of projects have demonstrated that by switching to the RMU Plug Flow Technology in combination with the use of the MESSNER Aeration Panels, it is not only possible to achieve energy savings of more than 40%, but also a stable and substantially improved cleaning performance, as well as positive effects on the sludge characteristics (e.g. low foam formation, improvement of sludge index, better stabilization, increased dewaterability).

Schematic representation of the intermittent nitrogen removal using RMU Plug Flow Technology.



High Performance Solutions.

Our solutions include expert advice and comprehensive support, far beyond the successful acceptance of our aeration system. The development of the process concept and the requirement-oriented design of the aeration system are followed by the installation and commissioning by our experienced installation personnel, complemented by operational support as well as the optimization of your control processes.



WWTP Kaiserslautern

- 215,000 PE
- MESSNER Aeration Panel
- RMU Plug Flow Technology
- Energy saving >40%



WWTP Rosenberg

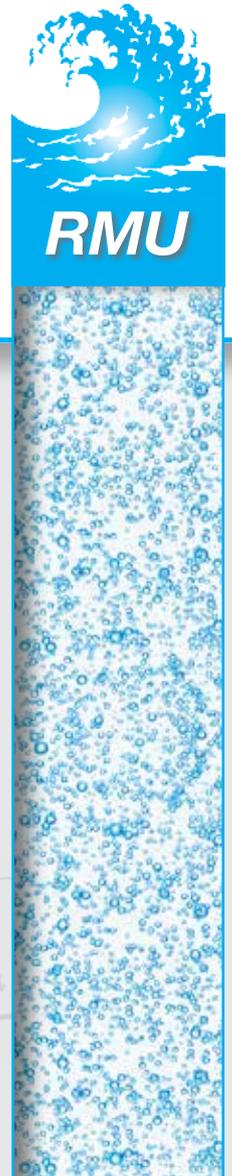
- 4,000 PE
- 3 MESSNER Aeration Panels installed on removable frames
- Circular ring tank with mixers



WWTP NUON Heinsberg

- 150,000 PE
- Industrial wastewater
- MESSNER Aeration Panel
- RMU Plug Flow Technology

RMU Plug Flow Technology. RMU Air Pulsing.



Our Service Promise.

Customer satisfaction is based on the high quality of the product, but also on the willingness of the manufacturer to support its customers and products during their lifetime. We not only provide

products, we also take responsibility for their operation, function and performance. This ensures that your aeration system will always achieve the performance that you expect from it.

Our service guarantees:

- Long-standing and reliable partnership
- Proximity to customers and short response times
- Operational and investment security





Worldwide in use.

RUDOLF MESSNER UMWELTTECHNIK AG is represented nationally and internationally by established sales and license partners, and offers the quality of MESSNER Aeration Panels you are accustomed to, in combination with professional installation and care, directly in the respective regions and countries of the world.

RUDOLF **MESSNER** UMWELTTECHNIK



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