demEAUmed Technologies

Smart Air MBR® Technology

Eight categories of innovative technologies together with a monitoring, control and decision support system are integrated and demonstrated in real life situation within the European project demEAUmed "demonstrating integrated innovative technologies for an optimal and safe closed water cycle in Mediterranean tourist facilities." This factsheet presents one of these eight technologies; the **Smart Air MBR®** technology.

Membrane bioreactors (MBR) are a consolidated technology for biological treatment of industrial and municipal wastewater. They guarantee high water quality which has led to a growing demand for this technology, especially in areas where water is scarce and its re-use must be prioritised.
The main MBR disadvantage is membrane fouling. Its minimization can be achieved by supplying air and incorporating backwashing cycles or relaxation modes to clean the membranes, actions that significantly increase operating costs.
Smart Air MBR® is the only product on the market that effectively reduces the energy costs associated with MBR air-scour according to the online monitoring of permeability, and places it in an excellent competitive position.

Applicability

The technology is innovative compared to existing technologies, which do not take into account the status of membrane fouling in real-time to control the process. It is suitable for the treatment of:

- Greywater; e.g. shower water and laundry water, and
- Domestic/industrial Wastewater.

Target pollutants are:

- Biodegradable organic matter,
- Nitrogen,
- Micropollutants such as pharmaceuticals and
- Microbiological charge.

The Smart Air MBR® technology, according to parameters of Spanish reuse legislations, could be potentially used for:

- Toilet flushing,
- Golf irrigation,
- Private garden irrigation and
- Groundwater recharge.

Design Criteria

In general, at demEAUmed

Size

1,4 m (w) x 1m (l) x 2m (h); indoor

Flows

0.5-1 m^3/d, in continuos

Location

At the greywater room storage for greywater treatment.
At the wastewater room for wastewater treatment.

The research leading to these results has received funding from the European Union's Seventh Framework Programme (FP7/2007-20) under grant agreement nº 619116

Operation and Maintenance

Several parameters of biological treatment and membrane filtration, level sensors and alarms are implemented in the system and can be monitored on-line in real-time.

An operator is needed to check and clean the membrane (physical and chemical cleaning).

Advantages of MBR® technology

- Reductions down to 20% of the air scour required to clean the membranes.
- Savings up to 35% of the cost of membrane aeration.
- Reliable control of membrane fouling parameters evolution together with biological process parameters.
- Optimisation on the frequency of maintenance cleanings.
- Stabilisation of the biological nutrient removal, maintaining or improving the quality of the effluent, in comparison with existing control systems.
- Extension of membrane life.
- Adaptation to any membrane configuration.

Costs issues (or additional value)

It only requires the standard instruments of a conventional MBR (permeate flux and transmembrane pressure), and it does not need any additional equipment other than remote connection and a server. Energy saving and water reuse are guaranteed.

Contact:

Smart Air MBR® Supplier: **Laboratory of Chemical and Environmental Engineering** (LEQUIA, lequia.udg.cat)
Phone: +34 972 41 98 59
E-mail: ignasi@lequia.udg.cat

Institut Català de Recerca de l'Aigua
Phone : (+34) 972 18 33 80
Fax : (+34) 972 18 32 48
Email: irodriguezroda@icra.cat

Please find further information and updates on demEAUmed project, its technologies and DSS at: www.demeaumed.eu

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