

## Technology Fact Sheet: MOL<sup>®</sup>LIK Catalyst

### Short description

The catalytic water treatment with MOL<sup>®</sup>technology combines energy-efficiency with eco-friendly approaches. MOL<sup>®</sup>LIK technology allows biocide-free water treatment, that means void of any biocides, gas or high energy radiation. This technology reduces the scaling potential and minimizes the risk of deposits on downstream surfaces. As a result, the system performance is rising and the maintenance effort is reduced. Up to now, typical applications for MOL<sup>®</sup>LIK are in the field of a quite stable water quality, like cooling tower applications and membrane plants.

The advantage of having the MOL<sup>®</sup>LIK technology in the INSPIREWATER project is twofold:

- ▶ For the EU & INSPIREWATER partners: rising efficiency of effluent water treatment with a completely eco-sustainable technology. This technology can deliver higher performance without risks for the humans, environment and technical equipment.
- ▶ For MOL: getting access to the market of effluent water treatment (water with high variation changes)

### Working principle

In liquid water there are two resonance structures: the bulk-water, which is similar to ice, and the molecular water, which is similar to vapor. There is a natural state of equilibrium between these two structures depending on temperature and pressure.

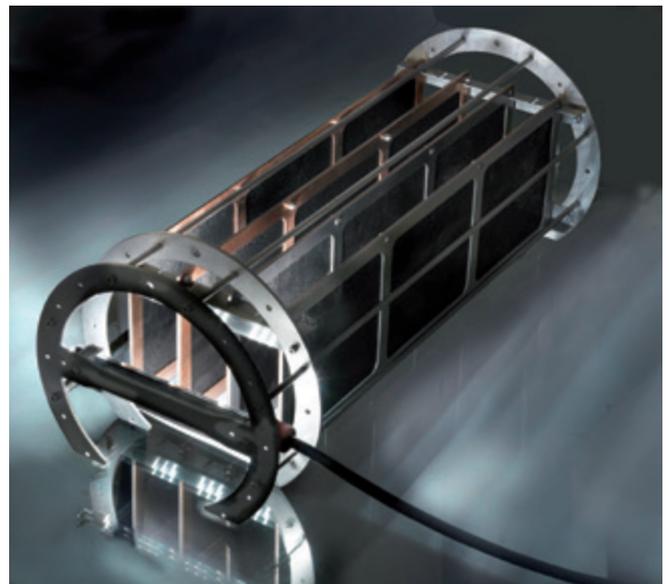
As a result of technical processes, for example heating, cooling, filtration, pumping etc., the natural equilibrium between the water structures is disturbed. This results in scaling and could lead to further fouling and corrosion. The MOL<sup>®</sup>LIK-catalyst speeds up the achievement of the natural equilibrium by being in contact with only a small quantity of water. Thereby, it is possible to reduce issues with performance decreasing deposits.

### SPECIFIC CASE at MEMBRANE APPLICATIONS:

On the pressure side, only the smallest water molecules are able to pass through the membranes. The installation

of a MOL<sup>®</sup>LIK-catalyst accelerates this process, as the thermodynamic equilibrium between water structures is achieved more quickly. In this way the issues with deposits are minimized and the water can pass more easily through membranes.

**Based on lab results made within the INSPIREWATER PROJECT there is evidence that MOL<sup>®</sup>LIK is able to accelerate the achievement of the equilibrium between molecular and bulk water.**



An installed MOL<sup>®</sup>LIK catalyst module.  
(source: prozesstechnik.industrie.de)

### Advantages

- ▶ Reduction of operational costs
- ▶ Minimization of chemical demand for hardness stabilization and corrosion control
- ▶ Improvement of TMP (transmembrane pressure)
- ▶ Extension of facility lifetime (e.g. filters and membranes)
- ▶ Rising performance of conventional water treatment technologies

## General data

Typical applications	So far, applications with quite stable water quality (e.g. cooling towers and RO-plants) With INSPIREWATER project possibility to explore the field of applications with more challenging and unstable water conditions.
Average electrical consumption	0.001 - 5.0 Wh / m <sup>3</sup> (day light LEDs)
Average chemical consumption	None

## Remarks

- ▶ The process is limited by specific facility conditions, for example, challenging water with bad filtration or the presence of some special film formation substances in the water, which may block the catalyst, e.g. silicates
- ▶ Efficiency can be enhanced by a little daylight (which can be reproduced by suitable LED-units)

## References and patents

**References:** So far there are no references in the field of effluent water treatment.

**Patents:** The catalyst and the technology are patented.

## Contact

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