

# MICROFLUIDIC REMEDIATION SYSTEM FOR WASTEWATER TREATMENT



## EDEN

To support the quaternary remediation step in water treatment plants, EDEN brings to the market a biomimetic (nature inspired) microfluidic system to remove organic pollutants, such as pharmaceuticals, plastic additives and pesticides, from wastewater.

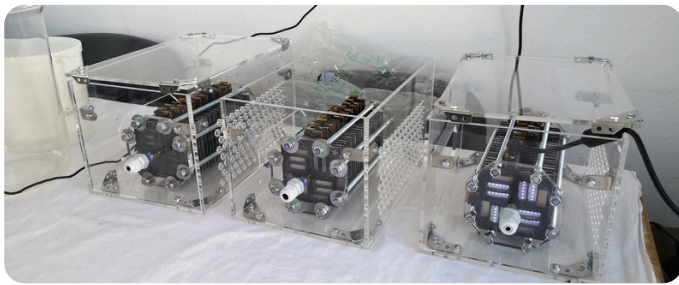


Figure 1: Scalable AKVO modules with stacks of microfluidic discs for increased water treatment capacity.

The revolutionary system draws inspiration from the human circulatory system. Just as the human circulatory system efficiently transports fluids and removes waste with minimal energy, AKVO's network of microchannels optimizes fluid flow and pollutant removal at low operating pressures and treats wastewater volume of up to 10 m<sup>3</sup> per day while consuming less energy than other conventional technologies. The device comprises microfluidic discs approximately the size of a CD. These are engraved with networks of microchannels and stacked into smart energy microfluidic grids.

Compact and sustainable design minimizes the prototype-to-product cycle and allows for a quick transition to industrialization.

The system's performance was validated during the iMERMAID's use case implementations at Opalia pharmaceutical company in Tunisia, where it was deployed to treat water heavily saturated with exceptionally high concentrations of pharmaceutical compounds such as ibuprofen, ketoprofen, and diclofenac.



Figure 2: A Single AKVO demonstration prototype module consisting of 20 discs.

In the long term, the solution will be able to treat volumes required by small municipalities and will offer the option for seamless integration to the existing plants. EDEN's microfluidic solution thus provides an adequate solution for the wastewater treatment plants with >100 000 and >10 000 p.e. load who are, according to the revised EU Urban Wastewater Treatment Directive, required to include the quaternary treatment stages by 2035 and 2040, respectively.

### Key Benefits



**Efficient:** Removes organic pollutants with efficiency >80%



**Sustainable:** Low energy use and carbon impact, chemical-free, water reuse



**Modular:** Scalable, flexible, easy to adjust to treatment needs



**Compact:** Seamless integration in urban settings, easy maintenance

