

Biological wastewater treatment

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Description of the technology

Organica Water is a global provider of innovative solutions for the treatment and recycling of wastewater. Over the past two decades Organica has developed a truly unique approach, enabling customers all over the world to address urban water challenges in a cost and resource efficient manner. Established in 1998 as a traditional design-build company, over its first nine years the company built 95+ wastewater treatment plants (WWTPs) for clients ranging from large municipalities to multinationals such as GM, Audi, Alcoa, Shell, and GE. In 2007 Organica sold its designbuild business to focus exclusively on the commercialization of its own Integrated Fixed Film Activated Sludge (IFAS) solution. Today Organica is the world leader in Fixed-Bed Biofilm Activated Sludge (FBAS) technology, with dozens of operating references all over the world.

FBAS is a type of IFAS system that leverages the use of various natural and engineered media to provide a habitat for a diverse fixed-film bacterial culture which metabolizes the contaminants in wastewater. These populations of organisms live in an attached form on fixed bed media inside the reactors, as opposed to being in constant motion as is the case with conventional solutions such as Activated Sludge or MBBR. Providing a stationary habitat allows an incredibly diverse and robust biofilm to grow and thrive inside the reactors, ultimately offering significantly improved nutrient removal, energy efficiency, and resiliency, all in much less space than conventional technologies.

Organica's FCR (Food-Chain Reactor) represents the best-of-breed in FBAS WWTPs. The FCR is a complete solution, including solids removal, biological treatment/nutrient removal, phase separation, and final treatment for reuse quality (if required), all incorporated into a compact, single structure. The biological treatment step is accomplished via a series of reactors, arranged in a cascade configuration to optimize the development of distinct ecosystems in each step of the treatment process.

Reactors in an Organica FCR utilize carefully selected plant root structures and Organica's proprietary biofiber media to provide an ideal habitat for a unique and diverse biofilm to grow. This biofilm contains 3-4x more biomass per cubic meter of reactor space than conventional solutions, ultimately meaning reactors in an Organica FCR are less than half the size of reactors in conventional wastewater treatment plants. This translates directly into a reduction in CAPEX (from both equipment and civil costs) and geographic footprint. Compared to other widely used solutions in the wastewater treatment field, FBAS brings significant operating cost savings, resulting primarily from lower energy consumption. The biofilm structure in an Organica FCR's reactors allows more efficient oxygen transfer, reducing the power consumed for aeration. When combined with the reduced sludge production resulting from the presence of higher-level organisms (e.g. a "food chain"), the ultimate result is a 30-40% reduction in OPEX compared to conventional solutions.

Keywords	Wastewater treatment, wastewater recycling, biological wastewater treatment, localization, urbanized solution, biotechnology, architecture, engineering, low CAPEX, low OPEX, small footprint, automatization, compact solution, odorless, botanical garden, 95+ references worldwide, biofilm
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Language of communication	English
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