

RCBR®: A New Solution For an effective and inexpensive Biological WWT

S. Vurro, S. Modenese – Eco-Sistemi Srl www.eco-sistemi.org, info@eco-sistemi.org

1. Introduction

- RCBR® is based on a biofilm adhesion on carriers made by a selection of different sizes of recycled plastic bottle caps contained in a cylindrical rotating permeable cell partially immersed in the wastewater
- The huge biofilm surface developed allows a strong reduction of organic pollution without artificial aeration in a small space
- RCBR® represents an ideal solution both for high and low organic pollutant levels (Industrial and Civil WW)
- Strengths: low energy consumption and operating costs, low sludge production, plug&play installation

2. Customer request

- The WWT of a pharmaceutical multinational factory consisted of a primary stage, a secondary stage with conventional activated sludge (CAS) and a downstream membrane filtration system
- The goal was to find a solution that would reduce energy costs, maintenance interventions, stress on the membranes and simplify the management of sludge
- The solution must allow to adapt to production increases without requiring further space

3. Case study

- In parallel to the existing biological oxidation stage (CAS), an RCBR® tester was installed treating flow rates from 0,5 up to 4 m³/h, monitoring performance at different retention times
- A one-year trial was conducted to compare costs and performance of both systems supported by weekly analyses in order to have statistical relevance



4. Results and comments

- The performances of the two systems are similar except for the outgoing TSS where CAS suffers from the limits of the technology
- These CAS values involve considerable costs for the management and disposal of sludge as well as continuous stress for the sidestream membranes used to intercept the solids; These costs are minimized by RCBR
- The net space occupied by RCBR is 10 m² to treat 4 m³/h
- Optimal economic performance was achieved with hydraulic retention time of about one hour
- The RCBR® energy consumption has been 0,15 kWh/m³, a fraction compared with CAS and 70% less direct labor costs were achieved

Parameters	IN	OUT CAS	OUT RCBR
COD mg/l	200-900	< 50	< 50
TSS mg/l	20-200	7500-9000	40-200
Surfactants mg/l	10-50	< 5	< 5