



# SMART WATER TREATMENT

V-ROTEX for a superior wastewater  
treatment efficiency



## TECHNOLOGY

Italbiotec is the holder of the European patent license for the **V-Rotex technology, an innovative system that combines the advantages of MBBR and Biodiscs.**

The V-Rotex geometry increases the exchange of nutritional components between the gaseous and liquid phases with **a reduction in the need for air compared to activated sludge systems (up to -80%).**

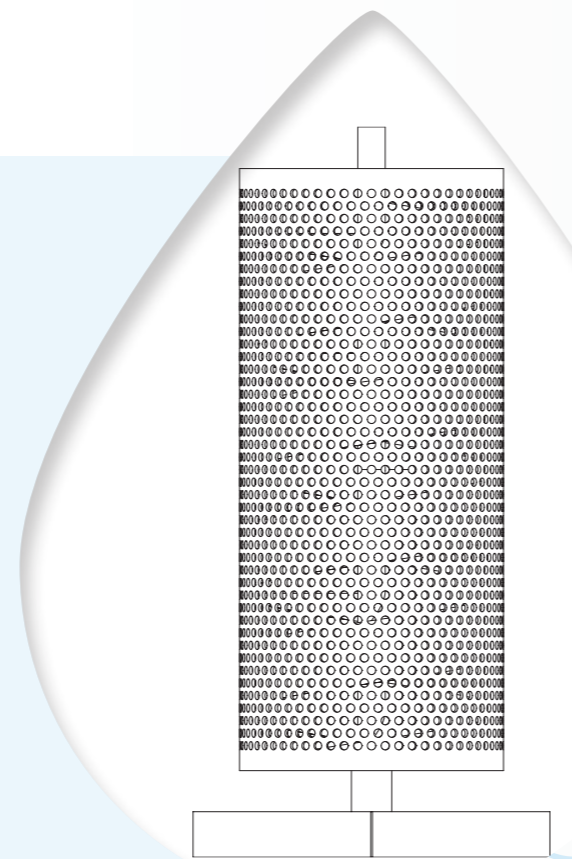
V-Rotex contains a high quantity of **adhered microbial biomass "biofilm" (500% compared to activated sludge)** and performs the **simultaneous nitrification and denitrification of civil and industrial wastewater** with high loads of COD and Nitrogen.

Italbiotec realized the first (6 mc) prototype of the **V-Rotex** technology to demonstrate that **is possible solve the most common problems of wastewater treatment plants.**

PROBLEM (activated Sludges)	SOLUTION (V-Rotex)
High consumption for the oxidation phase	<b>Reduction of consumption (up to 50%)</b> Reduction of need for air (up to -80%)
low adaptability to flow and load variations	<b>High treatment flexibility (+50%)</b>
High operating costs, sludge recirculation and disposal	<b>Less amount of sludge (up to -15%)</b> <b>No sludge washout (adherent biomass)</b> <b>Smaller volume of settlers</b>
New civil works to increase plant potential	<b>Simplified revamping, V-Rotex integrated into existing tanks</b>
Large dimensions and volume	<b>Reduced footprint compared to activated sludge (up to -75%)</b>

**Helix' rotation** and **the turbulent motions** generated by the anti-gravity movement of the gas bubbles in the water, **prevent blockages and the formation of preferential channels.**

V-Rotex allow to build **compact, flexible & modular systems with low energy consumption** comparable to those of trickling filters (25-50% of activated sludge).



## THE PROTOTYPE

### Characteristic data

- Installed power 3kW (consumption at full speed 2 kWh/h)
- Footprint 8 m<sup>2</sup> (3.944x1.839x1.977mm)
- Volume 6 m<sup>3</sup> (two 3 m<sup>3</sup> sections each equipped with a 0.8 m<sup>3</sup> V-Rotex)
- Treatment capacity 12-15 kg COD/day (350 PE)
- Reduction of 60-70% of N-NH<sub>4</sub> in input (simultaneous Nitrification/Denitrification);

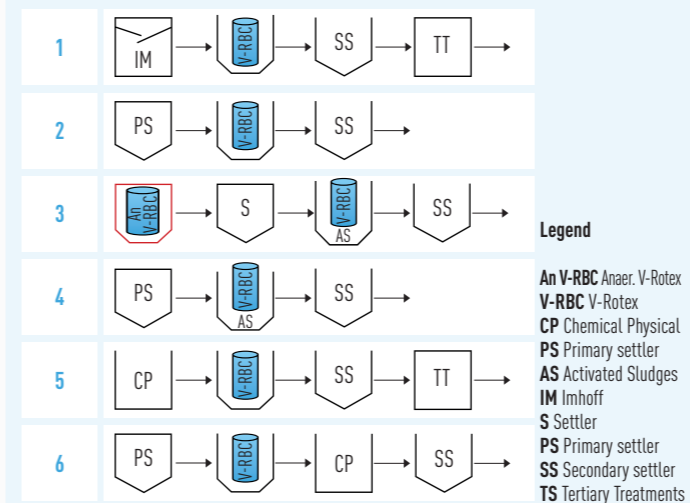
### Equipment

- 1 single screw pump for continuous feeding (1 m<sup>3</sup>/h);
- 1 blower (10 m<sup>3</sup>/h);
- 2 V-Rotex rotation servo motors;
- 2 temperature sensors and 2 ORP sensors.



1 First Test in parallel to a 500 PE wastewater treatment plant - 2 Blower and oxidation volumes (3 cubic meters each) - 3 Feeding pump view

### Applicazioni V-Rotex nel trattamento dei reflui



### V-ROTEX v/s activated Sludges fanghi attivi 1.000 PE

	V-Rotex	Activ. Sludges
Primary sedimentation	Yes	Yes
Tank volume	40 m <sup>3</sup>	120 m <sup>3</sup> + denitro
Sludge recirculation	No	Yes
Sludge treatment	No (monthly)	Yes (daily)
Nitrification/denitrification	Yes - 65% N-NH <sub>3</sub>	No (denitrif. req.)
Ordinary maintenance	weekly	daily
Electric power installed	4-6 kW	12 kW
Flexibility of load variations	50%	20%
Flexibility of flow variations	50%	20%





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POR FESR 2014-2020 / INNOVAZIONE E COMPETITIVITÀ

Beneficiary ITALBIOTEC SRL

Initiative implemented under *Axis I - Strengthening research, development and innovation*

**Objective:** Investments in favour of growth and employment

**Action I.1.b.1.2:** Support for the economic valorisation of innovation through experimentation and the adoption of innovative solutions in processes, products and organisational formulas, as well as through the financing of the industrialisation of research results

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