

INNOVUS

CONTACT

OFFICE: +27 (21) 808 3826
 FAX: +27 (21) 808 3913
 EMAIL: info@innovus.co.za

Bio-filtration System

High rate biofilm contact reactor for winery wastewater treatment

Innovus Technology Transfer (PTY) Ltd is Stellenbosch University's wholly-owned technology transfer company. Contact Anita Nel, Innovus Chief Executive Officer, on (021) 808 3826 or send an email to ajnel@sun.ac.za for more information.



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BRIEF DESCRIPTION

A bio-filtration system using a biofilm contact reactor has been developed to remove organic contaminants from wastewater.

Our biofilm is used as a biological scrubber, removing organic matter, and trapping solids, removing them from wastewater. When the biofilm becomes too thick and heavy to remain attached within the system, it is shed, providing for a novel means to remove waste biofilm biomass from the system. At the same time a new biofilm develops without interrupting the operation of the system.

UNIQUE CHARACTERISTICS

- Continuous bio-filtration producing **separate streams** of waste and filtered water
- The system separates solid and organic waste material from water in **one tank**
- No filters are used in the invention which means **less clogging** than traditional filtration systems

TARGET MARKET

- Wineries producing cellar effluent
- Production facilities that produce water with an organic waste component
- Wastewater management companies

VALUE PROPOSITION & BENEFITS

In conventional water filtrations systems, the biofilms that form during the filtration process are separated out or pumped to a separate collection tank. However, these conventional systems have to be stopped from time to time to remove the sediment.

This invention holds the following advantages over the conventional filtration system:

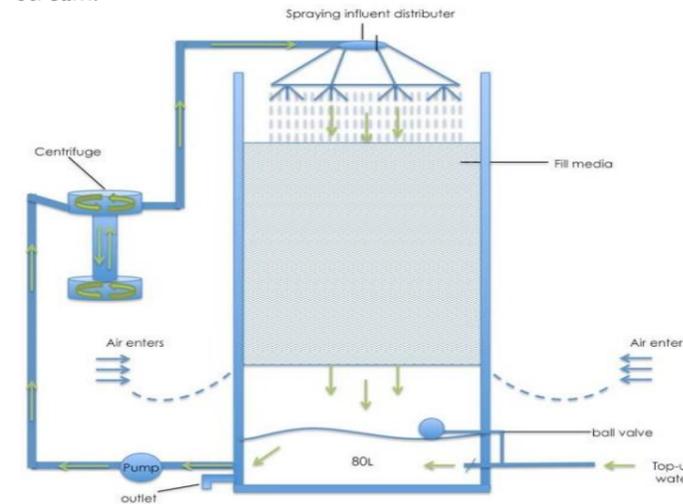
- Biological contaminants and solid materials are **continuously separated** out of the water without the need to disrupt operation to clean the packed bed
- This system requires **no additional settling tank**
- The system does not use filters that need to be cleaned or can become clogged with use
- Only a **small amount of waste** is produced from the filtration process leading to a lower environmental impact.
- The design of the filter allows for a **greater aeration** rate than a conventional filter, allowing for quicker breakdown of organic matter
- The system has a **smaller footprint** than conventional filters of the kind
- Almost **no (or none)** **pre-fabricated components** are required
- **Small capital outlay** to implement, especially if an existing water cooling tower is on site

TECHNICAL DESCRIPTION

In this invention, a tower with a packed bed of porous substrate material is provided, designed efficiently distribute wastewater over the substrate, with the simultaneous draft of air in the opposite direction, ensuring effective aeration of the system without additional energy required to power aeration.

Contaminated water enters the tower through the water inlet and a biofilm of a mixed population of microorganisms develops on the surface of the packed bed material. The biofilm covers a large surface area and, as it thickens, it serves as a biological scrubber to remove and break down organic contaminants.

The resulting biological sludge and solid waste matter is constantly removed by making use of a highly effective in-line separation method to produce a small volume of concentrated waste stream and a separate filtered water stream.



PRINCIPAL RESEARCHERS

Professor T.E. Cloete, Vice-Rector Research & Innovation, Stellenbosch University

Miss DM du Plessis, PhD Student, Department of Biochemistry, Stellenbosch University

Dr. M Botes, Researcher, Department of Microbiology, Stellenbosch University

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INNOVATION STATUS

National phase patent applications: Australia, Chile, China, Europe, USA and South Africa. A working prototype has been developed. Final research is being done to determine capacity requirements for different effluent output volumes