

Upgrading Effluent Quality with a Plastic Media Based Process

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Abstract

- Wastewater treatment plant retrofits worldwide are motivated by two main developments:
 - a. changes in effluent quality regulations,
 - b. population growth in certain areas.

In recent years, the EU (under directive EEC/271/91) and US (Section 304A of the Clean Water Act) have launched programs for nutrient removal in all existing wastewater treatment plants, originally designed for BOD and TSS removal. Similarly, in Israel, the recommended effluent quality criteria by the “Inbar Committee” are being considered as a basis for near future regulations.

- The process principle, in adding BOD removal capacity to existing wastewater treatment plants, is working at extremely high F/M values with respect to the suspended biomass, and letting the heterotrophic biofilm which develops on the free flowing media handle the excess load.
- Plant results show that the advantages of IFAS processes for nitrification include: low HRT, low SVI and process stability. Economic analysis on several wastewater treatment plant case studies in Israel, where adding nitrification capacity is required, shows that the relative low investment cost of an IFAS process is also an advantage.
- Results from an IFAS BOD removal reactor show that the required HRT for domestic sewage treatment can be reduced this way to about 4 hours.
- Processes utilizing free-flowing media as surface area for bio-films, are known as IFAS (Integrated Fixed-film Activated sludge) processes. These processes becoming one of the common technologies for retrofitting wastewater treatment plants for nutrient removal as well as for increased capacity.
- The AGAR IFAS nitrification process principle, where nitrification capacity is added to an existing wastewater treatment plant, is simultaneous nitrification by the biofilm which develops on the surface area of the free-flowing plastic media, and BOD removal by the suspended activated sludge. This enables to work at a low sludge age in the suspended biomass, and still hold enough nitrifying bacteria to comply with ammonia regulations.
- Respirometry can be used to compare sludges and biofilms for heterotrophic and autotrophic activity. The following charts show how relevant parameters effect the nitrification performance in each case.

For more details please contact AqWise - Wise Water Technologies Ltd.

