Application of IFAS Technology In Municipal Wastewater Treatment

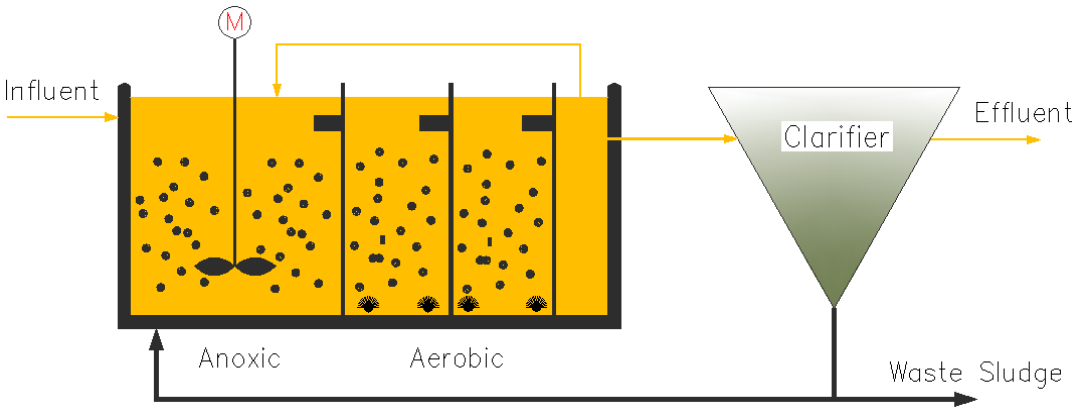
BioCell
MBBR & IFAS Technology

Case study	Municipal Wastewater
Start Up	May 2015
Capacity	50,000 m^3/d
Location	Zhuhai China

About FIxed Film Technology

An Integrated Fixed-film Activated Sludge (IFAS) process incorporates the technological benefits of traditional systems of activated sludge with biofilm systems of activated sludge with biofilm systems in a single reactor. The IFAS configuration is conventionally similar to an activated sludge plant that takes advantage of a variety of processes; namely MLE, UCT, or Bardenpho, with biomass carriers fed into predetermined zones within the activated sludge process. Two precise biological populations thus act in combination with MLSS to break down a major proportion of the organic load (BOD,) and the biofilm that results in a nitrifying population for the oxidation of the nitrogenous load.

IFAS is employed to update and improve nitrogen removal at plants already in operation. Additionally, IFAS can also be integrated in the design plans for new plants as part of a smaller footprint during the BOD and nitrogen removal processes.



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Challenges Faced by Existing Plants

The design capacity of the WWTP is 50,000,m3/d，the A2/O oxidation ditch be applied for biological treatment process, below data shows the influent and effluent parameters of the existing plant：

Project	Unit	Influent	Effluent
COD	mg/L	350	60
BOD	mg/L	160	10
NH3-N	mg/L	30	15
TN	mg/L	40	20

The effluent parameters requirement of completed plant：

Project	Unit	Effluent
COD	mg/L	40
BOD	mg/L	6
NH3-N	mg/L	5
TN	mg/L	15

Solution

Placing BioCell media into activated sludge basins creates a combination of suspended and attached growth biology that optimizes the benefits of both of these systems. Each individual piece of BioCell media has been specifically designed with a very high surface area-to-volume ratio to support the growth of biofilm. The surface area provided by the BioCell media creates additional active biology above and beyond the limits of the suspended activated sludge system.

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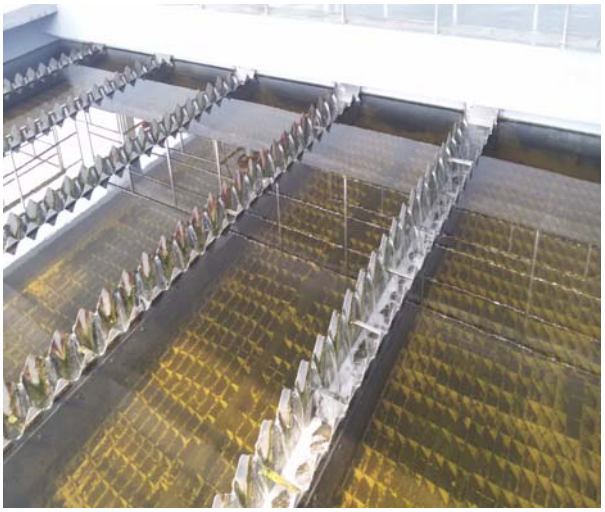
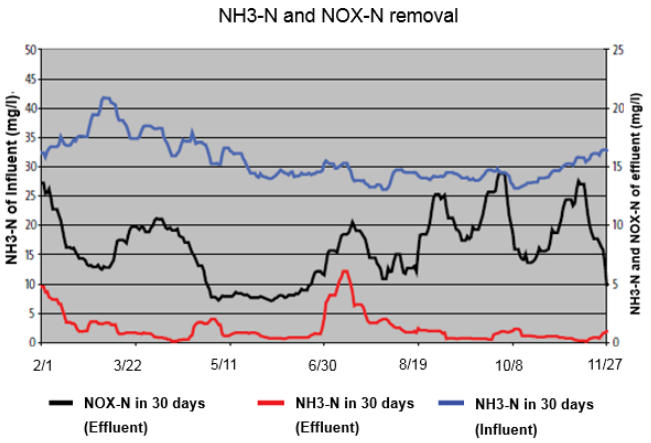
This can increase reactor capacity, in terms of organic loading, or support more advanced treatment of the wastewater due to longer sludge age. The additional fixed film biomass does not need to be settled out and returned and therefore does not increase the solids loading to the secondary clarifier, a factor that often limits the treatment capacity of activated sludge systems. IFAS technology addresses the need for increasing activated sludge plant capacity without additional clarifier or aeration basin volume. The fixed biomass also contributes to the ability of the process to respond to organic or hydraulic shock loads and to recover from upsets.



The BioCell IFAS process is the perfect solution for upgrading existing plants to support Biological Nutrient Removal without adding reactor volume. Portions of existing aerobic zones can be partitioned into anaerobic or anoxic zones for advanced BNR treatment and the addition of BioCell media to the remaining aerobic zones increases the Solids Retention Time (SRT) to a level needed for nitrification.

Results

Effluent COD and NH_4-N were well removed, the effluent quanlity could conforms to owner's permitted criteria.



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