



Headworks Bio Brings IFAS Upgrade to Port Klang WwTP in Malaysia

Background

Oleon is one of the leading producers of oleochemicals since the 1950s and specialize in converting natural fats and oils into a wide range of oleochemical products, such as fatty acids, glycerine, esters, dimers, technical oils, specialty oleochemicals and biodiesel. All the products, made from renewable raw materials, combine high performance with ready biodegradability.

Due to expansion and increasing production at the manufacturing plant in Port Klang, the COD levels of the wastewater were reaching up to 30,000 mg/l. The existing wastewater treatment plant, a conventional activated sludge plant, faced difficulties with high levels of contamination from fatty acids and esters, and was in need of expansion to 180 m³/d.

Headworks Bio Inc. was awarded the contract to design an Integrated Fixed-Film Activated Sludge (“IFAS”) process to increase the biological capacity of existing plant to 180 m³/d within minimal space available for additional reactors.

Customer: Port Klang
Industry: Fatty Ester



Process

One of the key challenges at the plant was to reuse as much as possible of the existing infrastructure while providing a compact solution to retrofit the existing activated sludge plant. As the plant could not be shut down for long periods, an easy to implement/retrofit solution was necessary. The existing activated sludge aeration tank was converted to a high rate BOD roughing reactor followed by a two stage IFAS reactor. The additional challenge of treating high strength wastewater with incoming COD and BOD loads up to 33,000 mg/l and 8,000 mg/l respectively and wastewater temperatures as high as 40 °C, meant the IFAS treatment process was an ideal choice. The self-regulating nature of the IFAS process was very appealing as it allowed the process to handle variations in influent loads by varying biofilm growth, and with minimal operational intervention.

“It’s a flexible design that allows for increased capacity in the future, when our plant production increases again. It’s self-regulating and has a stable community of bacteria under large variation in contamination” explains Luc Elegheert, Project Execution Manager for the project.

Results

The IFAS upgrade of the existing treatment plant treats 180 m³/day and reduces BOD to <100mg/l and COD to <1000mg/l respectively, thus producing effluent suitable for safe discharge. The two IFAS reactors have a total footprint of 135 m², a remarkably small size for a plant with such high influent loads.

Along with the process design, Headworks BIO has supplied the core components of the IFAS system including media, aeration grids, and media retention screens. Headworks BIO will employ their proprietary media, Active Cell₄₅₀, offering over 400 m²/m³ of protected surface area.

The Integrated Fixed-Film Activated Sludge (IFAS) process is typically installed as a retrofit solution for conventional activated sludge systems that are at or beyond capacity. IFAS upgrades offer an extremely cost-effective retrofit solution to wastewater plant expansions, taking full advantage of existing systems, equipment, process knowledge, training, and operator skills.

