



SAF[®]
Submerged Aerated Filter



Solutions & Technologies



Introduction

Submerged Aerated Filter (SAF™) technology introduced by Veolia Water Solutions & Technologies (VWS) over two decades ago has been further developed to include units to treat both municipal and industrial wastewater from 30 pe upwards. The largest unit currently in operation treats approx 86,000 pe.

The SAF™ is an upflow Bioreactor which employs a high efficiency neutral buoyancy plastic media. The SAF™ consists of a containment vessel made in either GRP, GCS, coated mild steel, stainless steel or concrete with internal dividing walls, internal air and water distribution systems, charge of plastic media and internal support structure. The media provides a large surface area on which the bacteria attach themselves to grow and live. Wastewater is introduced into the base of the SAF™ unit into the under decking plenum space. Air is introduced into the SAF™ through a separate diffuser system also located near the base of the unit. An air blower supplies oxygen to the SAF™ environment on a continuous basis. The air and water distribution system design is such that it creates a very effective mixing pattern within the SAF™. This pattern allows for rapid distribution of the wastewater throughout the packed media bed. This produces a homogeneous solution in full contact with the entire microbial population for the period of time that the wastewater is in the reactor.

The uniform mixing pattern is of key importance in providing a stable environment which has the ability to smooth out fluctuations that may occur in the influent concentrations. The high media voidage eliminates the need for backwashing, thus reducing operating costs and ensures minimal disruption of the biological process.

Because of the high media porosity, VWS SAF's™ are characterised by high retention times making them ideally suited to both BOD₅ removal and nitrification of wastewater. The neutral buoyancy of the media also simplifies reactor construction and maximises active biological volume.

Features

- Established/robust fixed film technology
- Resilience to shock & toxic loads
- Suitable for below ground, partially buried or above ground installation
- Compact footprint
- Low environmental impact
- Minimal manpower & energy requirements
- Simple to operate
- Low maintenance
- Low whole life costs
- Computer software designed to provide accurate sizing and guaranteed effluent discharge quality

BioSAF™ units

A complete integral treatment process, supplied in a GRP cylindrical tank and manufactured in a variety of sizes to treat pe's from 30 to 250. The unit consists of 3 compartments: a primary zone for primary settlement, a SAF™ zone for aerobic fixed film treatment and a humus settlement stage. The units are supplied in 1 metre lengths from 7 to 14 metres, sized for transportation in a standard container or road vehicle. Designed with no internal moving parts and non-clog coarse bubble diffusers and is capable of attaining discharge standards of 20BOD₅:30TSS:5NH₄-N (95%ile).

Modular SAF™ units

This unit is supplied in a rectangular coated or stainless steel tank and is designed to be used as part of a separate unit process configuration eg. PS/SAF™/HT. This modular process unit is suitable for treating pe's up to

800 or in multiples up to 3000pe. It is compact and simple to install with minimal disruption to the existing treatment system. The unit is ideal for upgrading existing works, for treatment at smaller sites or for emergency treatment during plant failure, maintenance or upgrading. To optimise performance and provide increased process security the modular SAF™ incorporates a minimum of 3 cells and is capable of attaining discharge standards of 20BOD₅:30TSS:5NH₄-N (95%ile).

Custom Built units

Designed and built to address specific site requirements and generally suitable for applications with a 1000pe. upwards, the units are built with either GCS or concrete tanks and utilise non-clog coarse bubble diffusers or high efficiency membrane diffusers. Like the modular SAF™, the custom built units are ideal for roughing, secondary, combined secondary or tertiary applications. Robust fixed film technology together with low OPEX/CAPEX ensure SAF™ technology is the first choice alternative to BAFF or AS systems. SAF's™ are ideal for treating municipal wastewaters or highly complex industrial effluents.

BioSAF™ and SAF™ are registered trade marks of Veolia Water Solutions & Technologies.



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