

Up-flow Anaerobic Floating Filter (UAFF) Reactor

Introduction

UAFF reactors are very similar to Anaerobic Filter reactors, where wastewater travels through a packed filter bed. The anaerobic filter is fed at a lower level and effluent exits at a higher level of the reactor. Unlike in anaerobic filters, instead of the packed filter bed, UAFF reactors have a Floating Bacteria Growing Media (BGM). Bacteria are attached on to the floating Bacteria Growing Media (BGM).

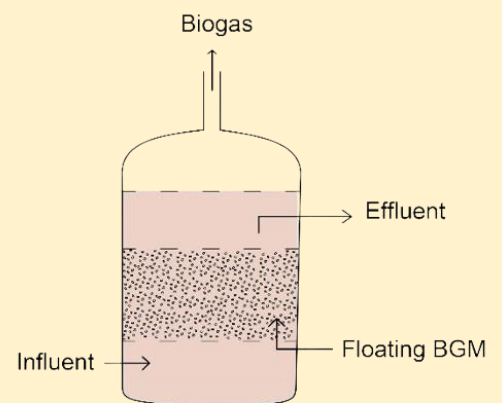
Operating Principle

This reactor contains a cylindrical tank. The influent is fed from the bottom of the reactor. There is a floating filter bed where bacteria are attached on to the filter media. While the fed slurry travels up through the filter media, anaerobic bacteria decompose them, producing biogas. Generated biogas gets collected at the top of the digester & is stored in a gas storage tank & used for different purposes.

Floating anaerobic filters provide a high surface area to volume ratio because of the fibrous growing media making UAFF reactor more efficient than Anaerobic Filters and UASB reactors.

Technical Details

- Height to Diameter (H:D) ratio of the cylindrical reactor ~ 1-1.5
- Suitable for feedstock with low suspended solids
- Total Solid content of influent ~ up to 3%
- Filter bed's volume ~ 40% of reactor's volume
- Works very well under mesophilic conditions
- Retention period 5-10 days



UAFF Reactor

Applications

UAFF reactors are suitable for treatment of soluble organic wastewaters. This is a widely employed anaerobic system for the treatment of organic wastewater in tropical countries & wastewater treatment of desiccated coconut & brewery industries and animal farms.

(Patented new technology in Sri Lanka)

Advantages

(over suspended-growth anaerobic high-rate reactors)

- Good load fluctuation resistance
- No clogging inside the floating filter bed due to movability of floating Bacteria Growing Media (BGM)
- Retains the bacteria even at relatively high hydraulic loads
- Shorter start-up time because of preserved inoculum
- Destroy virus, bacterial pathogens, protozoa, & helminths etc., & controls water borne diseases
- Sludge generation is almost zero
- Eliminates features such as sludge removal, sludge pumps & maintenance of aerators compared to conventional wastewater treatment systems
- Almost maintenance free

Challenges

- Pretreatment may be needed in treating different types of wastewaters with high COD levels.
- Comparatively more expensive than UASBs
- Dead-zone formation due to formation of preferential paths

References: Jayamanne, A (M.Eng. Dissertation, AIT, Thailand)

Author: Eng. Ajith Jayasuriya ; **Reviewers:** Eng. Athula Jayamanne & Eng. Namiz Musaffer