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Submerged Aerated Filters **TETRA™ SAF and NSAF**

Biological Wastewater Treatment

TETRA™ SAF
Submerged Aerated Filters

The TETRA™ SAF is a submerged aerated media process for the biological treatment of municipal and industrial wastewaters. The TETRA™ SAF is available in a range of sizes from small modular units for above ground construction, through to large bespoke design plants. All sizes of SAF are capable of achieving low effluent standards. A robust, small footprint system, it can be used for either secondary treatment (SAF/cSAF) or as a tertiary (nitrification) stage (NSAF).

TETRA™ SAF
Submerged Aerated Filters

The process uses proven TETRA™ SNAP T® Block filter floors and most commonly blast furnace slag media that cannot collapse or be lost by flotation; and with a proven long lifetime, media replacement costs are minimized. Other medias such as structured plastic can also be utilized to meet specific requirements.

The [N]SAF cell internals are based upon the same floor construction as the highly successful TETRA™ DeepBed™ Filter. Standard smaller units are available in circular GRP or stainless steel tanks up to 4 meters in diameter. Larger plants are constructed with concrete cells either 3 or 6 meters wide and varying length and number in order to meet the required treatment capacity. Influent distribution pipes or troughs are cast into the concrete floor on top of which sits an air header and manifold distribution system and then the TETRA™ SNAP T® Block floor that supports the media.

Media depths are typically between 2 and 4 meters. GRP or stainless steel launders are used to collect the treated effluent, which can be directly discharged or treated further as required by TETRA™ DeepBed™ Filters for example. Finished plants are often covered with mesh to contain any foam during the startup or operation of the plant.

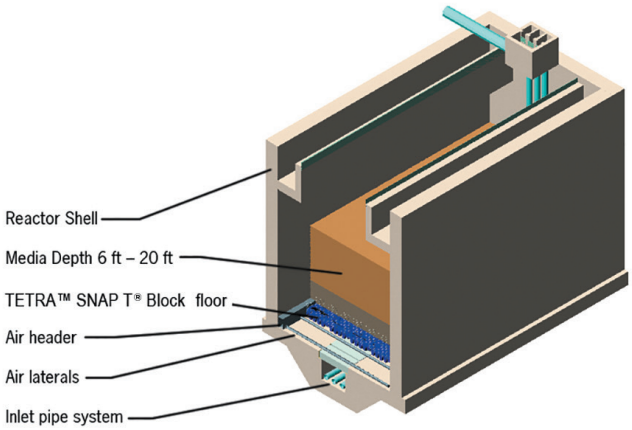
Principle of Operation

The TETRA™ SAF is a very simple process.

- Influent is distributed across the base of the reactor.
- Air is provided from an aeration grid on the base of the filter.
- The mixture of the influent and air travels upwards through the filter media bed.
- Biomass that is grown on the support medium carries out biological oxidation

System Components

TETRA™ SNAP T® Block



TETRA™ SAF - Construction

Applications

- Removal of BOD (SAF/cSAF)
- Removal of BOD and Ammonia (SAF/NSAF)
- Tertiary removal of ammonia (NSAF)
- Storm SAF - Tertiary ammonia removal and biological storm water treatment

Features

- Uses proven media
- More than 40 installations in the UK alone.
- Simple process
- No moving parts inside the cells or nozzles to block
- Available in various sizes and constructions including flexible modular units
- Flexible solution

Benefits

- Blast furnace slag media, where used, offers the benefits of high surface area; a media that cannot collapse; and superior life, thereby reducing replacement costs.
- Extensive experience gained by more than 10 years experience in the UK.
- Proven technology for wastewater treatment
- No backwashing or cleaning chemicals required.
- Low maintenance
- Capable of achieving low effluent standards
- Can be combined with different solids removal technologies.
- Air is supplied at a fixed rate, thus eliminating the need for any complicated control system

TETRA™ SAF and NSAF Submerged Aerated Filters

TETRA™ NSAF
Tertiary Ammonia Removal

TETRA™ NSAF (Nitrifying Submerged Aerated Filter) refers to the use of TETRA™ SAF technology as a tertiary ammonia removal process. It represents a simple, proven and cost effective way of achieving ammonia standards down to as low as 1 mg/L on a 95 percentile basis.

A biological treatment only step, the TETRA™ NSAF can be combined with tertiary solids removal processes, either new or existing, or where discharge limits permit will allow direct discharge without further treatment.

Blast furnace slag media is preferred for tertiary nitrification as it ensures consistent performance during cold spells.

TETRA™ NSAF+
Lowering operating costs

The NSAF+ is a new development for the TETRA™ NSAF system. NSAF+ uses a number of factors to match the treatment capability to the incoming load and thereby ensure significant reductions in operating costs.

This can be in the form of monitoring ammonia load and making automatic adjustments to the blowers and/or bringing cells on or off line to compensate.

The design is particularly well suited to large plants, where savings in electricity costs can have a major impact on budgets.

WATER MADE EASY

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DNWT - TETRA™ SAF and NSAF Submerged Aerated Filters - 650.0090EU.4 - 1/2017