ANOXKALDNES

AnoxKaldnes ANITA™ Mox

For efficient ammonia removal

VEOLIA

"More than 90% of ammonia and 75-85% of total nitrogen can be removed"

An energy-efficient process for removal of high ammonia loads in wastewater

The ANITA™ Mox processes – MBBR (Moving Bed Biofilm Reactor) and HYBAS™ (Integrated Fixed Film Activated Sludge) are single-stage deammonification technologies where more than 90% of ammonia and 75-85% of total nitrogen can be removed. The processes accomplish this removal without the addition of an external carbon source and with considerably less energy in comparison to conventional nitrification - denitrification.

The ANITA™ Mox process is specially developed for treatment of streams highly loaded in ammonia such as:

- Reject water following anaerobic digestion from municipal WWTP to reduce the nitrogen load on the main wastewater treatment line
- Industrial wastewaters, especially after anaerobic treatment
- Landfill leachates

Faster Start-ups

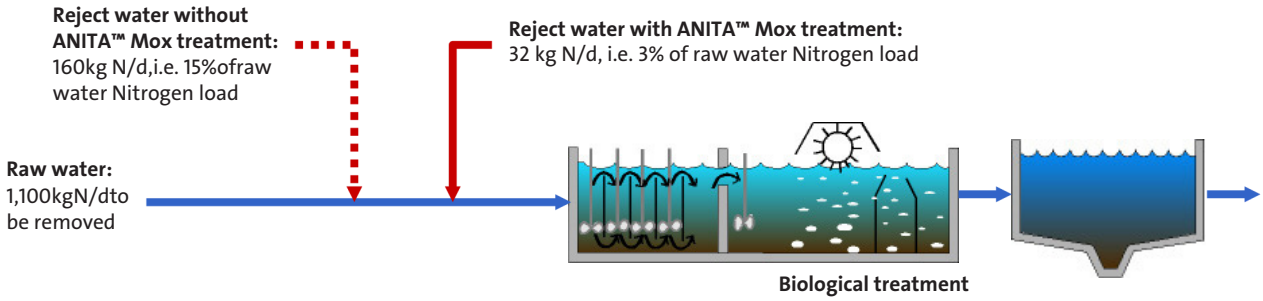
To reduce the start-up time, ANITA™ Mox plants around the world are used as Biofarms. Carriers containing biofilm are harvested from these operational plants and are used to increase the speed of commissioning by 70-80%.

Reject water treatment

High ammonia concentration with low COD concentration are typical characteristics of the reject water coming from dewatering of the digested sludge. Usually sent back to the main wastewater flow, the treatment of this ammonia load through conventional nitrification/ denitrification can be quite cost-intensive.

The use of the ANITA™ Mox process on reject water is a way to treat a part of the nitrogen at a low energy and chemical cost and thus reducing the overall consumption. In addition, it can dramatically reduce the nitrogen load on the main biological treatment line and is therefore an excellent solution to upgrade an overloaded existing wastewater treatment plant at a low cost.

Typical WWTP with a 100,000 PE capacity



ANITA™ Mox for mainstream treatment

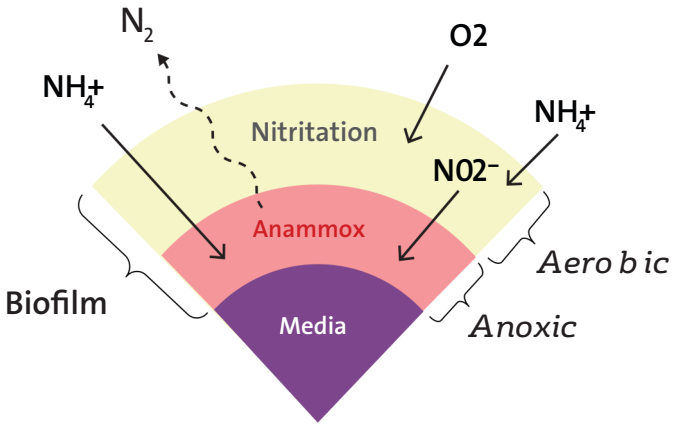
The next revolution in biological nutrient removal at municipal WWTPs is to implement deammonification systems in the mainstream process line and not just on the sidestream. The wastewater industry worldwide has a lot of interest in this paradigm shift. The possibility of removing most of the incoming nitrogen load without requiring large amounts of organic matter to denitrify opens new roads in the way we design and operate WWTPs. ANITA™ Mox has been tested and demonstrated in mainstream treatment applications is proven ready to be applied commercially.

The principle

The ANITA™ Mox process is performed in 2 steps: Aerobic nitritation performed by ammonia oxidising bacteria (AOB) and anoxic ammonia oxidation performed by anammox bacteria.
The two steps are taking place in a one-stage biofilm process in different layers of the biofilm:

Nitritation (aerobic) in the outer layer of the biofilm, and Anammox (anoxic) in the inner layer.

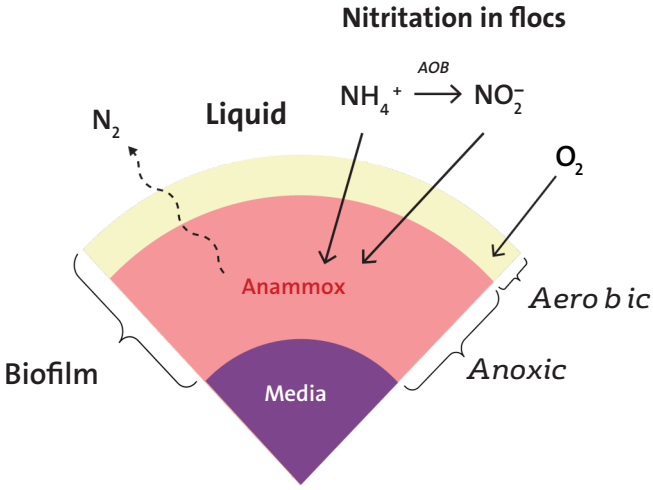
This can be achieved within a single MBBR reactor. Specific conditions (pH, temperature, oxygen level, NH_4 and NO_3 concentrations) are maintained within the reactor to allow the process-specific bacteria to grow as a biofilm on AnoxKaldnes carrier media.



All the benefits of proven MBBR technology are applicable to ANITA™ Mox including retention of critical biomass, a stable and robust process and a small footprint.

The HYBAS™ advantages

HYBAS™, IFAS (Integrated Fixed Film Activated Sludge) technology using suspended carriers has been a proven application of the MBBR process for more than 20 years. Applying the same concept to ANITA™ Mox has shown significant benefits.
As with any HYBAS™ system, suspended growth is retained in the system using a separation unit such as a settler.
With HYBAS™ ANITA™ Mox the nitritation step, or the conversion from ammonia to nitrite, takes place in this suspended growth. The production of nitrite has shown to be the rate limiting step in anammox conversion, and by moving this step to the suspended phase increases the nitrite production, thus providing an overall increase in anammox conversion.



Optimized performance with AQUAVISTA™ Plant

AQUAVISTA™ Plant is a cloud-based holistic service for real-time optimisation of process performance. Based on operational data from online sensors and algorithms, this digital solution calculates optimised setpoints for blowers, mixers, and pumps, to adjust oxygen and load, providing a state-of-the-art auto-pilot to optimise the whole treatment process.

Key features

- Automated real-time Performance Optimisation
- Remote monitoring of operation via a User Interface
- Availability of expert feedback on performance and recommendations for further optimization

Key benefits

- Stable optimal conditions 24/7
- Maximal utilization of all the ANITA™Mox benefits

ANITA™ Mox benefits

- Compact process
- Almost 60% oxygen savings
- No carbon source needed
- Reduced sludge production
- Robust process
- Stable process
- Quick start-up with the Biofarm concept
- Lower CO_2 emissions

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