Assets

FLEXIBILITY
The BIO-DENITRO™ method offers a high degree of flexibility as the duration of the main phases and the intermediate phases can be varied within very wide limits. This operating principle is therefore perfectly suited to cope with fluctuations in pollutant loads, flows and temperature.

SIMPIFIED MANAGEMENT
The plant is controlled and monitored by a computerized system allowing continuous monitoring and optimisation of the duration of the aeration and anoxic phases and the recirculation flow.

FIABILITY
The BIO-DENITRO™ and BIO-DENIPHOB™ processes have been thoroughly tested and implemented in hundreds of treatment plants worldwide. A precise knowledge of the operating parameters stems from this experience. The fact that these can be readjusted at any time always guarantees the required effluent quality.

ECONOMY
This alternating system avoids the recirculation of high flows for denitrification and the need for pumps for this. In connection with optimised aeration control, it provides a considerable energy saving.

ADAPTABLE
The processes can be used irrespective of climate, plant size, tank configuration and the type of water to be treated. A BIO-DENITRO™ configuration can easily be extended at a later date to BIODENIPHOB™.

BIO-DENITRO™
BIO-DENIPHOB™
Wastewater
BIO-DENITRO™ and BIO-DENIPHO™ are biological treatment processes for removal of carbon, nitrogen and phosphorus from wastewater.

The technique used is an original application of the activated sludge principle and involves the control of a sequential treatment of pollution in adjacent activated sludge tanks.

The BIO-DENIPHO™ and BIO-DENITRO™ processes, which can be applied in any type of reactors, are very flexible. The former enables removal of nitrogen from the wastewater and the latter nitrogen as well as phosphorus.

**Definition and application**

**BIO-DENIPHO™ process**

The BIO-DENITRO™ process comprises two identical activated sludge tanks and a settling tank. The activated sludge tanks, fitted with aeration and agitation devices, are interconnected and operate alternately, but with continuous feed and discharge of wastewater.

The wastewater to be treated arrives through a distribution chamber and is introduced into one of the tanks. The treatment is achieved by repeating one sequence which includes two main phases, A and B:

- In phase A, the untreated water is introduced into the first anoxic tank, from where the nitrates accumulated during the previous phase are removed. The mixed liquor passes into the second tank which operates under aerobic conditions to enable nitrification and elimination of organic pollutants.

- During phase B, the water is admitted to the second tank, and the denitrification and nitrification phases are inverted compared to phase A.

Sludge from the settling tank is mainly recirculated upstream of the biological treatment unit in order to maintain a consistent concentration of the purifying biomass. The surplus is removed for further treatment.

**Principles**

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**Operating principle**

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**Principle of Channels**

**Operating principle**