

UASB

Anaerobic purification of industrial wastewater

Application

Anaerobic waste water treatment is applied in many industrial areas for waste water purification of water containing large amounts of organics (COD > 2.000 mg/L).



UASB reactor

This technique is applied to circumvent the high operational costs of aerobic waste water treatment and to produce energy in the form of biogas. For this purpose a number of UASB reactor types can be used.

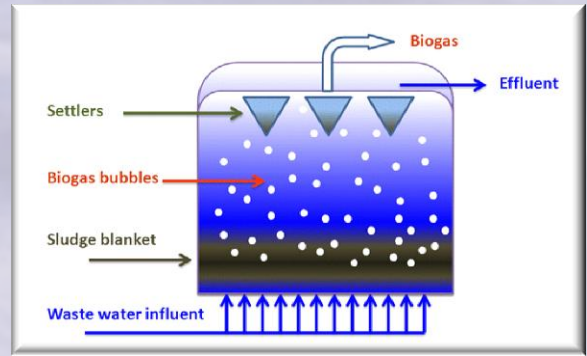
Additional advantages of this approach are :

- reduced sludge production and
- revenues from the granular sludge.

Process

Anaerobic waste water treatment represents a process in which bacteria (in the absence of oxygen) transform the organic matter present in biogas, i.e. methane and carbondioxide (CH₄ & CO₂).

This process takes place in a so called UASB (Upflow Anaerobic Sludge Blanket) reactor. The wastewater is continuously fed into the bottom section of the reactor by means of a dedicated distribution system.



Schematic representation of an UASB reactor equipped with a 3-phase separator

The design ensures an equal distribution of the fresh feed throughout the reactor face resulting in an optimal exchange between influent and biomass.

The waste water passes through the (granular) biomass layers (sludge blanket) in the reactor during which the biological conversion of the COD takes place according to the reaction scheme below:



At the top of the reactor the water, the biogas just formed and the biomass are separated by means of a 3-phase separator.

Results

UASB type processes provide an effective treatment for a wide variety of industrial waste waters and coincide with:

- low operation costs,
- high energy yields (biogas) and
- low amounts of sludge production.

Under optimal process conditions the following removal yields are recorded:

Component	Removal (%)
COD	70 - 90
N (nitrogen)	~10
P (phosphorous)	~10

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