



BIOPAQ® UASB

Cost Effective Treatment of High COD Wastewaters

The BIOPAQ® upflow anaerobic sludge blanket or UASB process is ideally suited to treating industrial wastewater containing medium to high concentrations of soluble organics (ie BOD in excess of 1000 mg/L). This anaerobic process requires very little energy (no aeration) and by virtue of its biogas generation is, in fact, a net energy producer. Carbon is largely converted to methane and carbon dioxide, resulting in virtually no net sludge production.

Aquatec-Maxcon is the licensee for the Paques BIOPAQ®. The UASB has a distinguished international reputation for being highly reliable and economical.

WATER WITH A COD OF UP TO 200,000 mg/L AT PROCESSING TEMPERATURES OF 20-40°C CAN BE TREATED BY BIOPAQ® TO ACHIEVE 50—90% COD REMOVAL

DESIGN ADVANTAGES

- ◆ Low energy requirements
- ◆ BIOPAQ® can be 50X more extensive than conventional aerobic systems and hence the small 'footprint'
- ◆ The flowsheet for a UASB is uncomplicated (Figure 1)
- ◆ Extensive design and operating data is available for many different wastewaters.
- A modularised design accommodates a wide range of flows and COD strengths
- The BIOPAQ® UASB reactor produces a useful methane by product, typically 0.35m³/kgCOD removed
- Effluent from the BIOPAQ® UASB reactor does not suffer from corrosion as plastic is used at and above the corrosive air/liquid interface

AS OF 2006 THERE ARE OVER 600 BIOPAQ® PLANTS INSTALLED WORLD WIDE

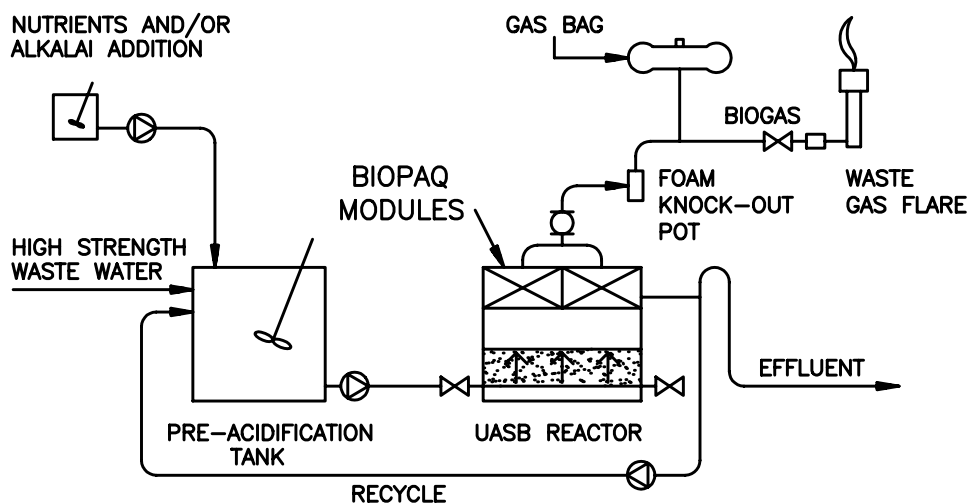


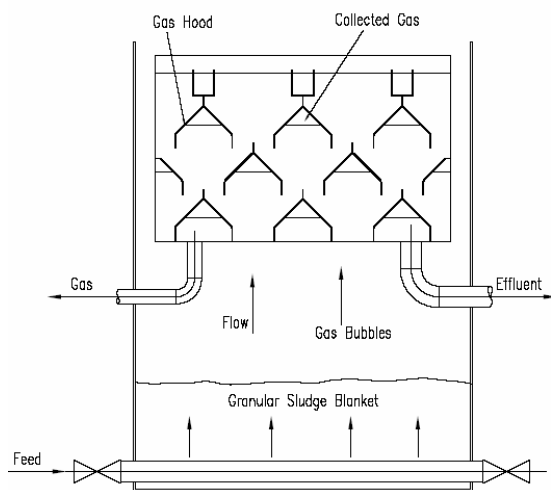
FIGURE 1 : SIMPLIFIED TYPICAL UASB FLOW SCHEMATIC

DESIGN FEATURES

The BIOPAQ® process (Fig 1) is initiated by:

- i. Soluble organic components in the waste are partially biologically converted to volatile fatty acids (VFAs) in a preacidification. The residence time required for acidification is four to six hours.
 - ii. The pH of the wastewater is adjusted and nutrients are added, if required.
 - iii. The conditioned wastewater is introduced into the reactor, where the conversion of soluble organics to VFA's is completed and the VFA's subsequently converted to an energy rich biogas of methane and carbon dioxide
 - iv. Some treated wastewater may be recycled to return alkalinity to the system.
 - v. The biogas may be used in a boiler or other devices or burnt in a flare
- ◆ An ingenious patented influent distribution system into the UASB reactor ensures superior mixing between influent and biomass and allows backflushing
 - ◆ BIOPAQ® plants are tailored for each application. Each module is 50m³, so plants arrange in size from 50m³ up to 10,000m³, where multiple reactors are employed
 - ◆ Designs are based on organic loading rate, OLR in kgCOD/m³d; OLRs range from 8 for intractable wastes and/or easily degradable wastes. Aquatec-Maxcon also markets a specially developed version of UASB, capable of up to 40 kgCOD/m³d
 - ◆ Three layers of generously spaced gas collection hoods facilitate low liquid velocities and hence give superior gas/solid/liquid separation over single hood designs.

UASB REACTORS CONSUME CONSIDERABLY LESS ENERGY THAN AEROBIC SYSTEMS



For any given waste it is important to fully understand the treatability of the waste. Aquatec-Maxcon provides on site testing of particular wastes through the use of its pilot-scale UASB plant.

APPLICATIONS

- ◆ Breweries
- ◆ Distilleries
- ◆ Paper Mills
- ◆ Soft Drink Plants
- ◆ Sugar Mills
- ◆ Wood Panel Mills
- ◆ Other Industrial Wastewaters
- ◆ Starch & Potato Factories
- ◆ Canneries
- ◆ Dairies
- ◆ Food Factories

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