

Aquatec Maxcon have worked closely with Paques of the Netherlands for high rate anaerobic processes for over 30 years, delivering a range of world's best practice wastewater treatment plants. These technologies offer energy production from the waste source in an extremely small footprint and are particularly suited to the Food and Beverage and Pulp and Paper industries.

Paques' BIOPAQ® range utilises anaerobic granular technology in a range of process configurations to suit each individual application. A brief description of each of these technologies follows:

### UASB



Paques' Upflow Anaerobic Sludge Blanket (UASB) systems are a world's leading technology using granular biomass for the treatment of high COD waste streams which frequently emanate from food, beverage and similar factories.

UASB systems are currently operational at Carlton United Brewery (Brisbane, Australia), Golden Circle (Brisbane, Australia), Cadbury (Hobart, Australia), Mars (Ballarat, Australia) and Samoan Breweries (Apia, Samoa).

### Advantages of BIOPAQ®UASB

- Very efficient COD removal
- Production of biogas, a sustainable source of energy
- Modular system
- Small reactor height
- Corrosion-free design: ten year guarantee
- Fully accessible for inspection and cleaning
- Closed system: no odour emissions

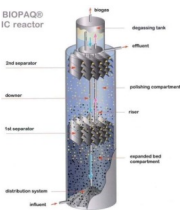
#### CHARACTERISTIC

COD level  
Loading rate

#### INFLUENT SPECIFICATION

1,000 to 20,000 mg COD/l  
10 - 15 kg COD/m<sup>3</sup>/day

IC Reactor



Paques Internal Circulating technology enables even greater volumetric loading rates and improved process stability enabling the minimum possible footprint. These plants have low energy requirements and deliver substantial volumes of renewable biogas for plant boilers or co-generation facilities.

IC Reactors are currently operational at the XXXX Brewery (Brisbane, Australia), Visy Paper (Sydney, Australia), Tooheys Brewery (Sydney, Australia), the Smiths Snackfood Company (Brisbane, Australia) and in Samoa and New Zealand.

Advantages of BIOPAQ®IC

- Very efficient COD removal, through intensely mixed biomass at bottom of reactor
- Production of green energy
- High reliability; self regulating through the internal circulation mechanism
- Excellent ability to handle variable influent loads
- Optimal biomass retention through reduction of hydraulic gradient through reactor
- Compact, extremely low footprint with no odour emissions

| INFLUENT SPECIFICATION |                                   |
|------------------------|-----------------------------------|
| CHARACTERISTIC         |                                   |
| COD level              | 1,000 to 20,000 mg COD/l          |
| Loading rate           | 20- 30 kg COD/m <sup>3</sup> /day |

Anaerobic Flotation Reactor AFR

Wastewater with fats, oil and grease and/or solids such as proteins and starch, can effectively be treated in the BIOPAQ®AFR. This anaerobic flotation reactor (AFR), with an effective sludge retention system, is an all-in-one system that converts organic compounds into valuable biogas.

Wastewater from the food industry is especially suitable. The compactly designed bioreactor treats wastewater with a COD content from 5-70 g/l with vegetable or animal fats at hydraulically short retention times from 1-8 days.

The intensive contact between the open bacteria flocks and the organic compounds in combination with the biomass retention in the integrated flotation unit is the success factor for this technology.

### Advantages of BIOPAQ®AFR

- Considerably reduces discharge costs, with 90-95% COD removal in most cases
- Produces valuable biogas
- Combines the best characteristics of the compact high rate anaerobic reactors and the CSTR
- Is a compact reactor; short hydraulic retention time and long biomass retention
- Requires no acidification or solids separation up front
- Has no odour emission because of its closed design
- Very efficient COD removal, through intensely mixed biomass at bottom of reactor

| CHARACTERISTIC | INFLUENT SPECIFICATION                 |
|----------------|----------------------------------------|
| Industry       | Food (dairy, vegetable oils, abbatoir  |
| COD level      | 5 - 70 g/l                             |
| % fats         | max 50% of total COD                   |
| BOD/COD        | 0.3 - 0.6                              |
| TSS            | up to 7% (if solids are biodegradable) |

In addition to the Paques high rate technologies, Aquatec Maxcon offer a range of low rate tank and lagoon based solutions for industrial applications