The Paulaner brewery

BIOPAQ®IC and CIRCOX®

Maximising sustainable effluent treatment by means of combined anaerobic and aerobic technologies with limited available plant space.

The Paulaner brewery is situated downtown Munich just about 20 meters from the next urban area. At our plant, Paques built a highly efficient installation on a very small footprint.
We don't cause odour emission in the neighborhood although we purify both anaerobically as well as aerobically up to 20 tons of COD per day.
Our biogas output is excellent, reaching a CH_4 value of 80 to 85 percent.

Dr. Ing. Johannes Fischer, Operational/Environment Manager of Paulaner

The challenge

- Limited plant space available (70m² for 2 reactors)
- Stringent site requirements in urban area
- Fluctuating wastewater qualities
- Maximum COD and BOD effluent concentrations of 1,000 and 500 mg/l respectively

The solution

- Combined advanced anaerobic and aerobic technologies of BIOPAQ®IC and CIRCOX®
- Compact reactor design
- High H_2S removal efficiency
- Reliable and stable process

The benefit

- Reduction of discharge costs
- Odour free installation
- Replacing up to 20% of natural gas use with biogas from wastewater
- Application in urban area

Facts and figures

Process

- 2.7 million hectoliters of beer/year
- Temperature between 28 - 38 °c
- PH level between 2 - 12

Effluent

- Wastewater flow 2,400 m³/day
- Processing COD load of 20,000 kg/day
- T-COD is 5,000 mg/litre
- T-BOD is 3,350 mg/litre

The challenge

Paulaner was founded in 1634 and is the biggest Bavarian brewery. The annual output of the brewery is approximately 2.7 million hectoliters. Paulaner is market leader for wheat beer. The main specialties are Paulaner and Hacker Weißbier, Premium Pils, Original Münchener and Salvator.

High quality standards can be seen throughout the brewery, where the best available techniques are being used. Like many other breweries, Paulaner was confronted with high pollution charges. To save on costs, the company decided to pre-treat their wastewater before discharge in the city sewer.

Since the brewery is located near the city centre of Munich in a residential area, the immediate surroundings of the brewery had to be taken into careful consideration. This resulted in a package of strict requirements for the design, as well as for the subsequent construction of the installation. Only an extremely small area at the Paulaner site was available for the wastewater purification installation. Noise and odour emissions standards could by no means be exceeded.

The solution

Due to the rapidly rising costs of process water and wastewater, pro-active water management and wastewater treatment are of increasing importance in the beer industry.

Major reductions in discharge costs are achieved by treating wastewater on site. Anaerobic treatment converts organic components into valuable biogas, thus reducing discharge costs and energy costs at the same time.

The flow and chemical composition of the wastewater fluctuates significantly. This is a normal consequence of the brewing process, but it does require a flexible operating installation. Paques successfully combines anaerobic with aerobic and/or bio-membrane technology and has more than 200 references in the beer and beverage industry.

Paulaner decided to expand her capacity of the existing wastewater purification installation with an anaerobic BIOPAQ®IC reactor and an aerobic CIRCOX® reactor.

Combined Paques technologies helped Paulaner to:

- Reduce discharge costs and comply with environment regulations
- Reduce energy costs by generating renewable energy from wastewater
- Enable recycling of process and non-process water (such as water for steam boilers)
- Reduce water consumption

The benefit

BIOPAQ®IC
The anaerobic BIOPAQ®IC reactor decomposes organic components in the wastewater and produce green energy in the form of biogas. The biogas is used in the steam boilers at the brewery and covers to 20% of the total natural gas requirement for Paulaner's production. The biogas output is reaching a CH_4 value of 85 percent.

CIRCOX®
The aerobic CIRCOX® reactor oxidizes hydrogen sulphide and decomposes the residual contamination. The treated wastewater is discharged into the public sewer system without problems. This wastewater treatment plant is a completely closed system without emissions. No noise and odour pollution occurs, providing that this concept is ideal for densely populated areas like the Paulaner brewery in Munich.