

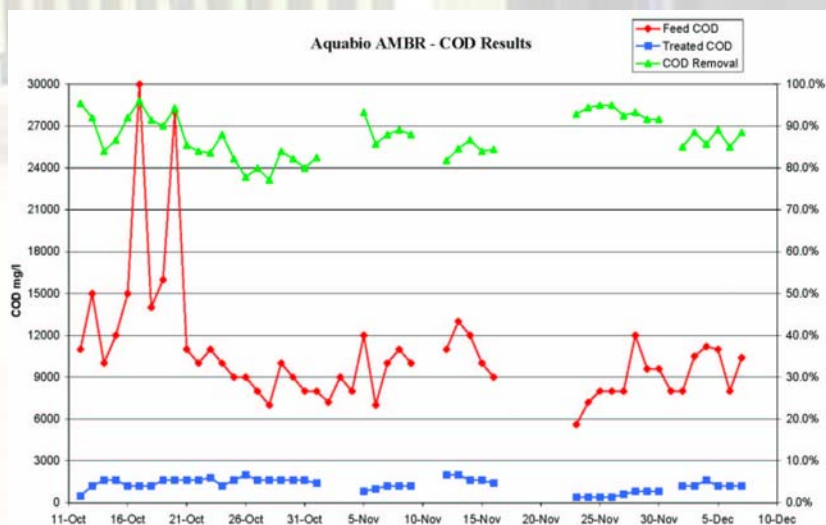


AMBR MEMBRANE BIOREACTOR REDUCES ANIONIC AND NON-IONIC DETERGENTS

Aquabio's Membrane Bioreactor (AMBR) unit effectively treats high strength cosmetics wastewater and reduces surfactant levels

Aquabio Ltd has applied its AMBR Membrane Bioreactor technology to successfully treat high strength cosmetics wastewater. The AMBR system enables in excess of 80% COD reduction, with >90% non-ionic surfactant and >95% anionic surfactant reduction.

The AMBR process has the versatility to treat an incoming COD ranging from 6,000mg/l to 30,000mg/l. The cross flow UF membrane modules used for biomass separation enables process and equipment optimisation to suit the high COD strength and surfactant fluctuations in the raw wastestream. The plant is fully automated with PLC control and data logging of key process parameters (e.g. flows, dissolved oxygen, pH, temperature etc.)



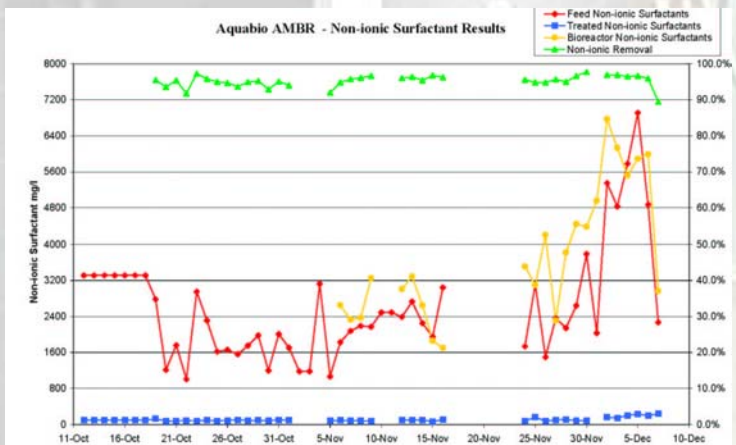
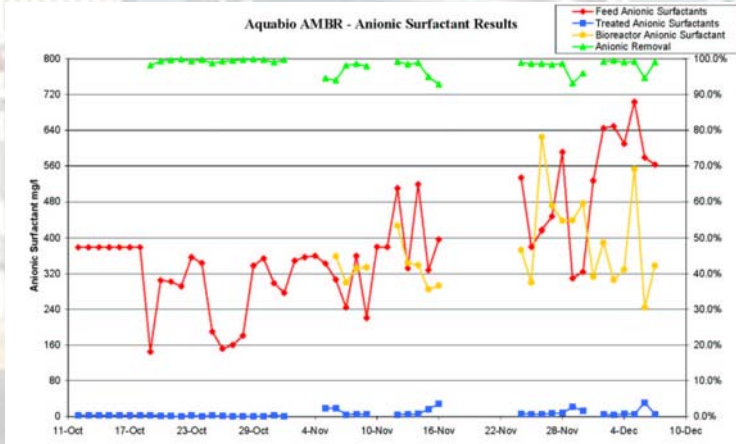
The Aquabio JETOX aeration and mixing system is incorporated into the bioreactor to achieve the necessarily high rates of oxygen mass transfer into the biomass. The high 'shear stress' and bioreactor turnover rate created by the JETOX helps reduce the viscosity of the concentrated activated sludge. This high shear on the MLSS/ biomass is crucial in improving the actual oxygen transfer rate compared with 'conventional' aeration systems when applied to MBRs. The JETOX can operate either with, or without, blower assistance with integral air flow monitoring.

The intensive aerobic environment created in the bioreactor (with MLSS levels in the range of 11,000mg/l to 28,000mg/l) combined with the high sludge age means that high quality final effluent can be achieved in a very compact area. The ultrafiltration biomass separation system also opens up opportunities for possible water reuse (with tertiary treatment e.g. nanofiltration/reverse osmosis etc.).

High surfactants levels resulting from detergents contained in the untreated wastewater were causing problems at the local municipal water treatment works. Almost immediately the AMBR achieved excellent reduction in both the non-ionic and anionic constituents. During the test period untreated anionic concentrations varied from 145mg/l to 704mg/l (averaging 380mg/l) reducing to a range of 0.4mg/l to 31mg/l (averaging 6.1mg/l) in the AMBR treated effluent.

Similar performance is achieved for the non-ionic surfacants which are present in much higher concentrations in the raw wastewater. The incoming levels vary from 1,005mg/l to 6,910mg/l (averaging 2,603mg/l) which were reduced to between 63mg/l and 239mg/l

In spite of early foaming during start-up due to high residual levels of detergents in the initial 'seed' biomass, the AMBR system has proved very robust and extremely efficient in both COD/BOD and surfactant reduction. With the UF membrane biomass separation in place the final suspended solids levels are also reduced to below 5mg/l.



AMBR Industrial Market Areas (strong wastewaters)

- Pharmaceutical
- Pulp & Paper
- Chemicals/synthetics
- Landfill leachate
- Tanneries and rendering
- Food & drinks processing
- Breweries & distilleries
- Textiles & associated industries (pesticide removal)
- Petro-chemical & refinery

For further information about Aquabio Membrane Bioreactor systems and other products and processes, please contact us at Aquabio Limited, Worcester, UK, either by e-mail or fax.

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