

Svardal K. ,Lindtner S. ,Winkler S. (2002): Optimum aerobic Volume Control based on continuous In-Line Oxygen Uptake Monitoring Vortrag bei: ENVIRO 2002 & IWA World Water Congress, Melbourne, Australia

**Abstract:** Dynamic adaptation of the aerated volume to changing load conditions is essential to maximise the nitrogen removal performance and to minimise energy consumption. A control strategy is presented which provides optimum aerobic volume control (OAV-control concept) based on continuous in-line oxygen uptake monitoring. For ammonium concentrations below 1 mg/l the oxygen uptake rate shows a strong and almost linear dependency on the ammonium concentration. Therefore, the oxygen uptake rate is an ideal indicator for the nitrification performance in activated sludge systems. The OAV-control concept provides dynamic variation of the minimum aerobic volume required for complete nitrification and therefore maximises the denitrification performance. In-line oxygen uptake monitoring is carried out by controlling the oxygen concentration in a continuous aerated zone of the aeration tank and measuring the total air flow to the aeration tank. The total air flow to the aeration tank is directly proportional to the current oxygen uptake rate and can therefore be used as an indicator for the required aerobic volume. The instrumentation requirements for installation of the OAV-control are relatively low, oxygen sensors in the aeration tank and an on-line air flow measurement are needed. This enables individual control of aeration tanks operated in parallel at low investment costs. The OAV-control concept is installed at the WWTP Linz-Asten (1 Mio PE) and shows very good results. Full scale results are presented.