

MEASURING OXYGEN UPTAKE RATES AND SHORT-TERM BOD USING THE CHALLENGE OUR-200 RESPIROMETER

Measurement of oxygen uptake rates in activated sludge processes is essential to their satisfactory operation. Traditionally, oxygen uptake rates (OUR) have been determined by using a dissolved oxygen probe to measure the change in dissolved oxygen in a BOD bottle. While this method is rapid, it provides only a snapshot of the pattern of oxygen uptake in a treatment plant. Much more can be learned about the operation of a treatment plant by measuring the oxygen uptake rate over a period ranging from one to four hours after adding waste to the mixed liquor. The resulting pattern of oxygen uptake rate can be used to assess biodegradation patterns, to determine the impact of various wastes on treatment plant performance, and to provide a short-term measure of BOD.

An example of a typical OUR test is shown below. The data show the background OUR for the MLSS and a 60/40 mixture of wastewater. As indicated, the maximum OUR was around 30 mg/L-hr. This value corresponds to the value that would be obtained by a single measure using a DO probe. The difference between the oxygen uptake of sample plus seed and seed alone produces a short-term BOD curve. The cumulative oxygen uptake after a few hours gives an estimate of the standard 5-day dilution BOD.

