

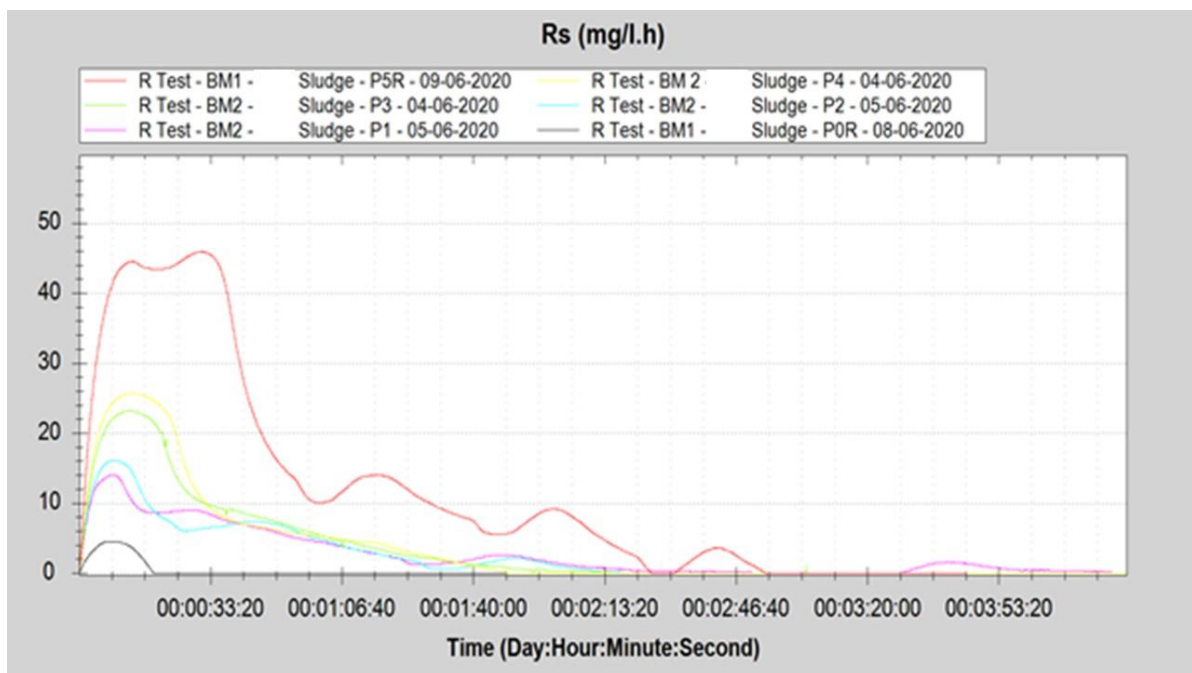
Respirometry

Respirometry evaluations provide a valuable diagnostics tool in deciding whether an aqueous waste stream produced from industrial production processes is suitable for biological water treatment or for offsite disposal. The data and respirograms reported below are an example of an analysis of 6 aqueous process waste water samples

The **red** line is an example of a highly biodegradable substrate while the **grey** is poorly biodegradable, the other 4 lines show various degrees of biodegradability and hence suitability of the substrate for successful biological water treatment.

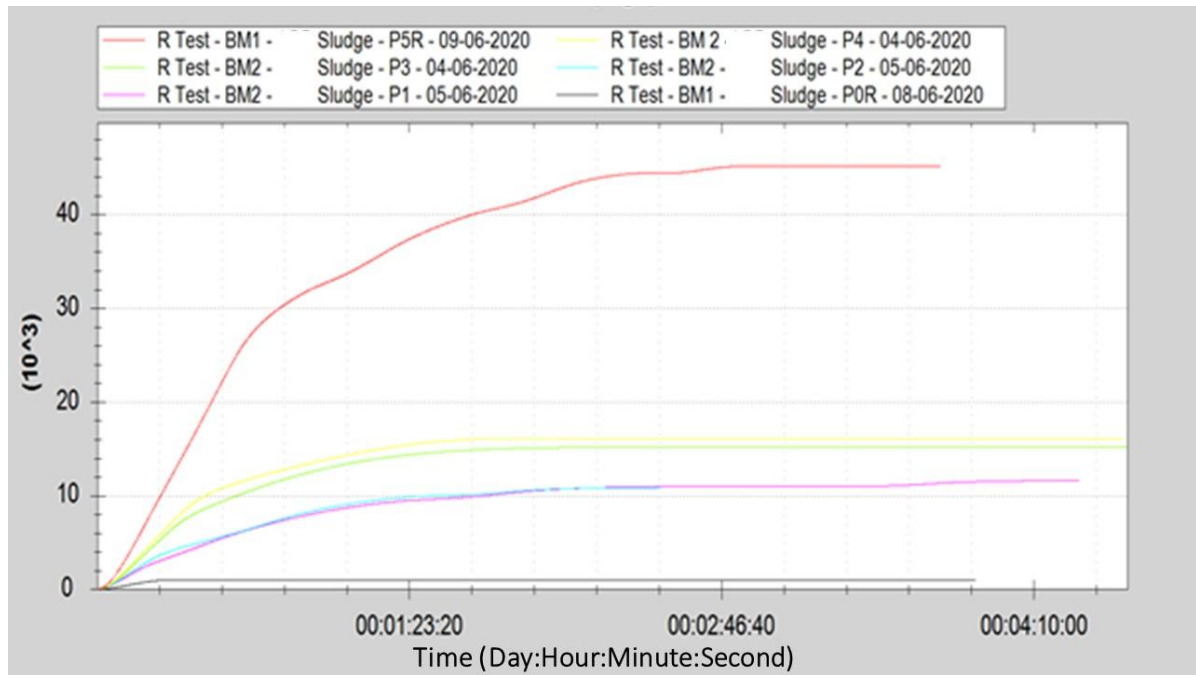
It is clear from the trending presented in the produced respirograms of each substrate at set evaluation conditions that the respiration rate of the biomass responds with increasing rates of oxygen uptake, when comparing substrate 'P5R' to substrate 'POR'. In this particular example all potential aqueous substrate samples barring the sample represented by the grey line POR were deemed suitable for biological wastewater treatment.

Respiration Rate. RS Respirogram, Biomass Respiration rate mg O₂./hr



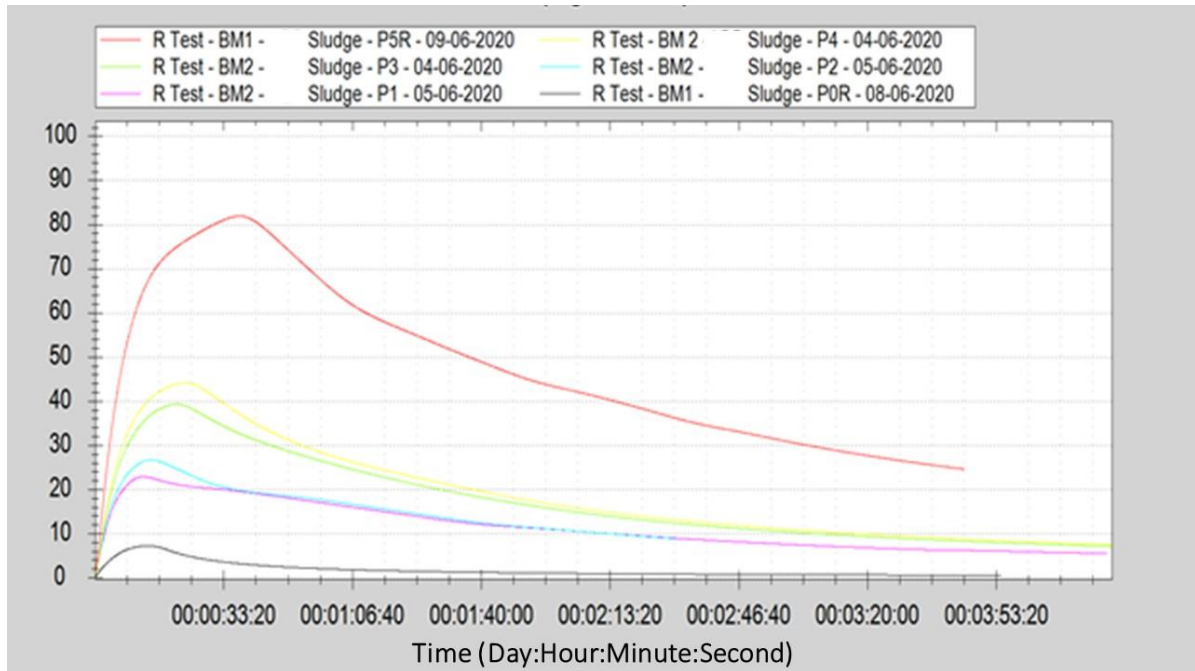
Rs, the Dynamic Exogenous Respiration Rate reported in mg of Oxygen per litre per hour (mg O₂/l.h) corresponds to the respiration rate exclusively related to the oxygen demand of the substrate with the activated sludge per time unit. It is clear from the trending presented in the produced RS respirograms that the respiration rate of the biomass responds with increasing rates of oxygen uptake when comparing substrate 'P5R' to substrate 'POR'. Biomass Respiration rates increase 10-fold when comparing substrate P5R with POR.

Consumed Oxygen, CO Respirogram, Consumed Oxygen Rate mg/l



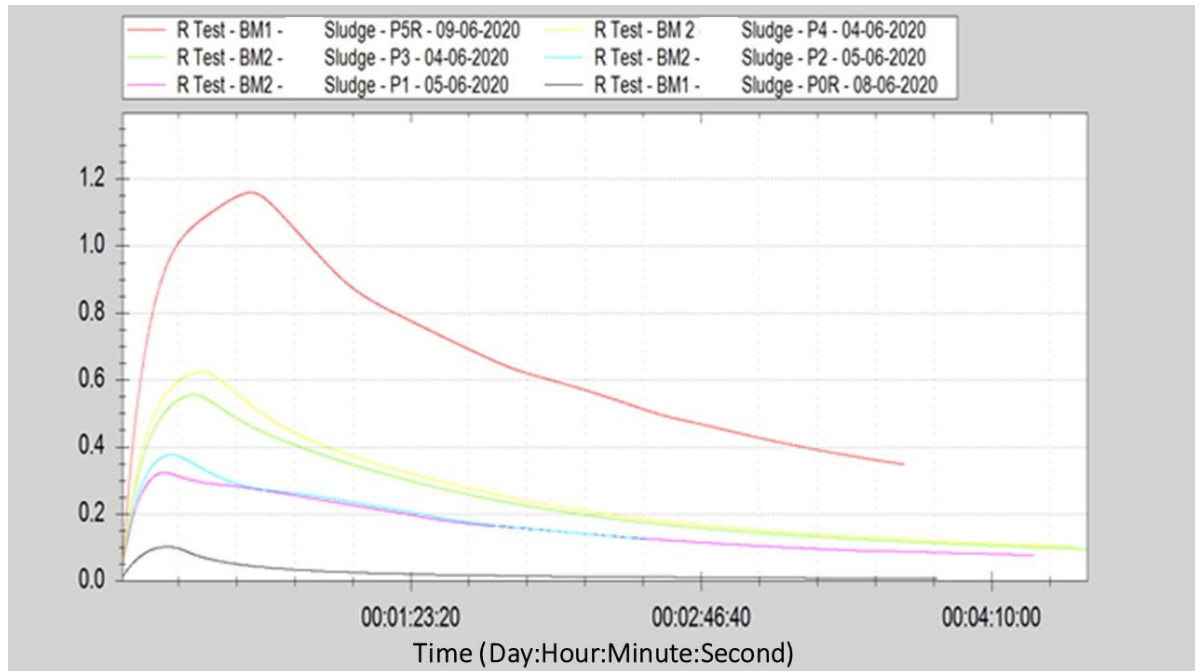
CO, corresponds to the total consumed oxygen utilised in the substrate oxidation by the activated sludge. A 10-fold increase in the actual consumption of oxygen by the Biomass is observed when comparing substrates POR and P2, the consumption increases by a magnitude of 45 when comparing POR to P5R.

U RATE Respirogram, bCOD Utilisation rate bCOD/ l.hr



The U rate is defined as the COD utilisation rate as a kinetic parameter, the U rate is equivalent to the velocity at which the biodegradable COD is being removed within determined conditions of temperature, pH, MLVSS. The U rate increases almost 4-fold when comparing substrate P2 to P0R and 11-fold by point P5R when compared to P0R.

Q rate Respirogram, bCOD utilisation rate specific to MLVSS



The Q rate also referred to as the maximum specific substrate rate, is the specific COD utilisation rate as a kinetic parameter, that represents the specific U per unit of MLVSS, calculating how quickly bCOD is consumed per unit of MLVSS, again the q rate increases significantly when comparing substrate P5R to substrate P0R confirming that the biomass can assimilate substrate P5R more efficiently and effectively than the other substrate samples.

Further information

<https://enva.com/water-services/waste-water/advanced-respirometry>

Please contact us to discuss your requirements, or to request further information at marketing@enva.com