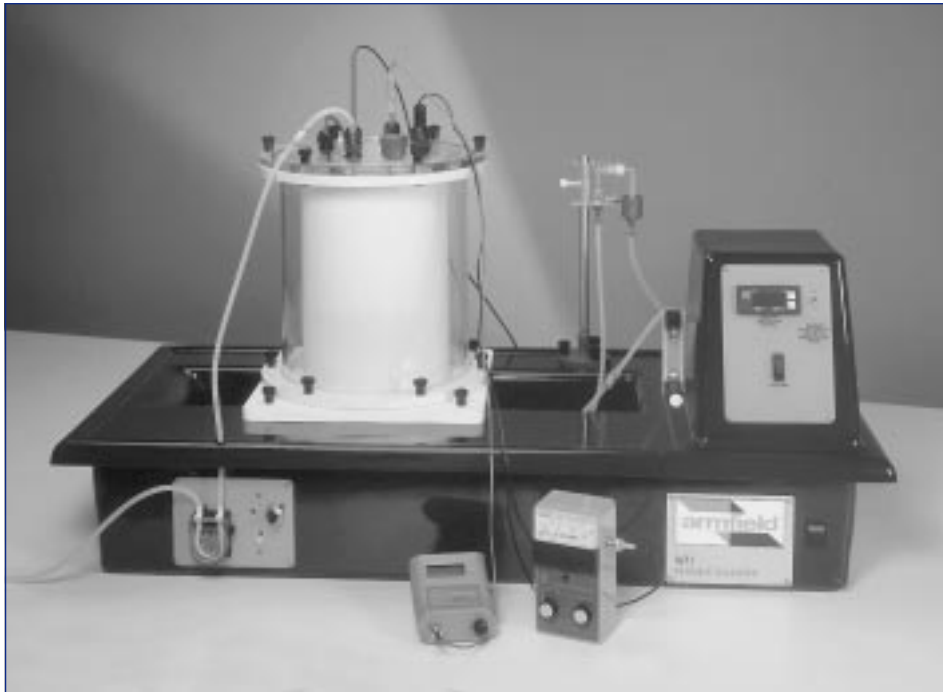




armfield

AEROBIC DIGESTER

W11
issue 6



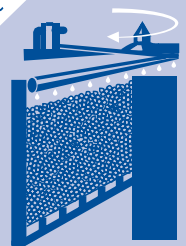
The continuous activated sludge process has been successfully employed in public health engineering installations for nearly a century. The Armfield bench top Aerobic Digester is designed as a comprehensive study facility of this biological water treatment process. A synthetically prepared waste water may be used to gain a working knowledge of the operational parameters and purification efficiencies.

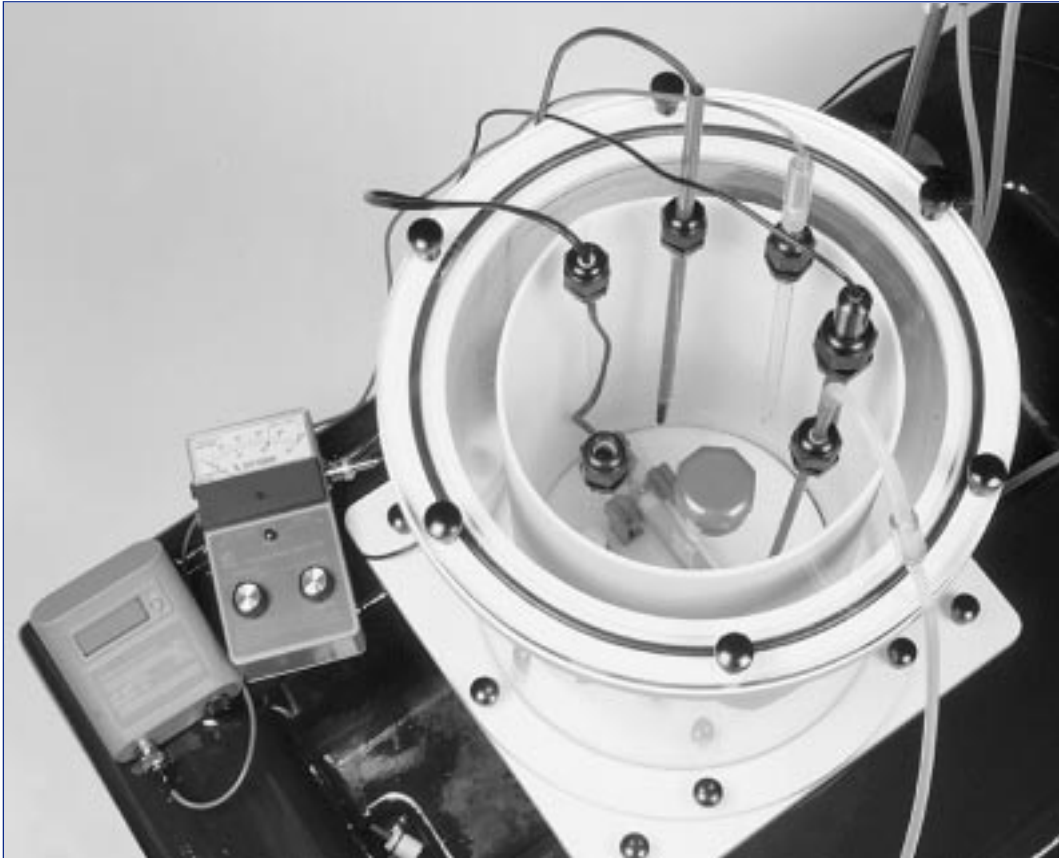
PRACTICAL TRAINING EXERCISES

- *Acclimation of a completely mixed biological reactor*
- *Measurement of COD and MLSS changes as criteria of performance*
- *Establishing the stoichiometry and kinetics of aerobic biological processes*
- *Gas/liquid mass transfer*
- *Residence time distributions*
- *100% scale-up to industrial requirements*
- *Studying the effect on effluent quality of:-*
 - *inflow substrate concentration ('loading rate')*
 - *liquid flow rate and reactor volume ('detention time')*
 - *air flow rate*
 - *temperature*
 - *pH stability*
 - *nutrient deficiency*

Water Treatment Processes

W





Aerobic Digester

DESCRIPTION

The equipment consists of a ten litre reactor vessel mounted on a vacuum formed plastic base, with a liquid feed pump, air supply and instrumentation for monitoring and controlling the process.

The cylindrical wall of the reactor is made from a porous plastic material to retain the suspended solids while allowing treated water to pass through to the outer, annular exit chamber. This design allows the essential features of the aerobic treatment process to be studied without the distractions of having to settle the solids adequately enough for external recycle - a well known laboratory problem.

The porous liner is removable for cleaning, and a spare liner is supplied.

Waste water is drawn from a floor-standing feed tank (not supplied) by a DC motor driven peristaltic pump. Rotational speed and thus flow rate, are accurately set by a ten-turn potentiometer. The pump delivers the feed to the reactor vessel through a transparent lid. Air is supplied at a

measured rate by a small compressor, and discharges into the base of the reactor via a spider-arm dispenser, designed to prevent blockages as well as to produce sufficient bubbling for stirring and reaction. The liquid level in the reactor is maintained at a constant value of 5-10 litres, by an adjustable overflow device connected to the outer annular chamber of the vessel. Discharge is by gravity to a floor-standing product tank (not supplied).

The reactor temperature is maintained by a 3-term controller which varies power to an immersion heater within the vessel. Any temperature between ambient and +35°C may be selected, the best conditions being a few degrees above the diurnal maximum in the user's laboratory.

Dissolved oxygen and pH probes and meters are included .

The reactor lid contains a gas exit port, suitable for sampling the gases for subsequent analysis.

TECHNICAL SPECIFICATIONS

Feed pump: 24V DC, peristaltic, 0-30rpm
corresponding to 0-40 litres/day

Air compressor: 240V /120V, 0-3.0 litres/minute (STP)

Reactor vessel: 10 litres maximum capacity

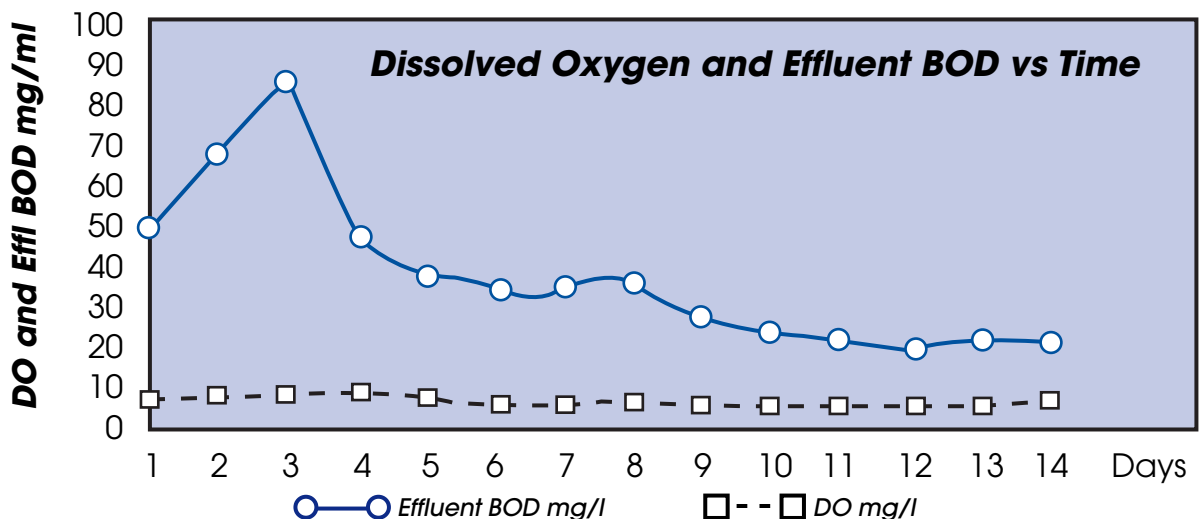
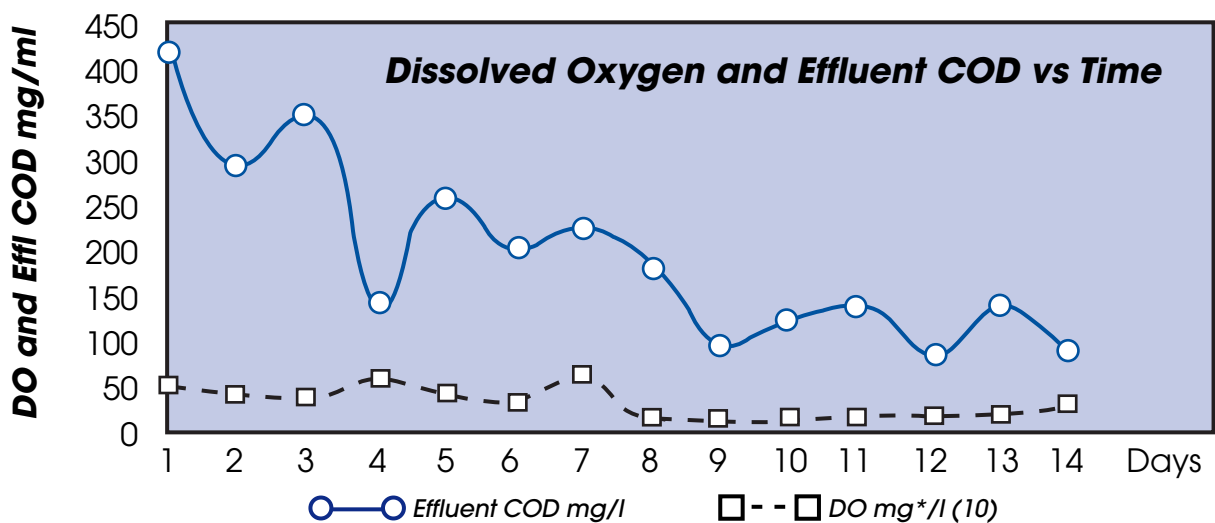
pH meter: Range: 0.00 to 14.00

Dissolved oxygen meter: Range: 0-100% saturation
Resolution: 2%

Reactor heater: Toughened glass, electrical
immersion 200W

Temperature controller: 3-term PID
Temperature limit set at 35°C

TAKEN FROM A THESIS SUBMITTED AS PART OF A POST GRADUATE DIPLOMA IN WATER RESOURCES SYSTEMS ENGINEERING AT THE UNIVERSITY OF NEWCASTLE UPON TYNE, UK.



ORDERING SPECIFICATION

- *A 10 litre bench mounted aerobic reactor, complete with peristaltic feed pump, air compressor and temperature control system.*
- *Dissolved oxygen and pH probes and meters are included.*
- *The reactor consists of a cylindrical porous liner held in position with sealing rings between the lid and the base to facilitate removal for cleaning and replacement.*
- *Suspended solids are held within the reactor volume, whilst treated water permeates through the porous liner into an outer annular exit chamber.*
- *The water level is maintained by an adjustable constant head overflow device.*
- *This digester system is designed to operate safely and reproducibly for periods of many days.*
- *The equipment is mounted on a moulded plastic base, equipped with an internally moulded drain channel, designed to cope with spillages and wash-down water.*

SERVICES REQUIRED

Electrical supply:

W11-A: 220/240V/1ph/50Hz

W11-B: 120V/1ph/60Hz

W11-G: 220/240V/1ph/60Hz

OPTIONAL ACCESSORIES

CW -16 - Chilled water circulator. For simulation of low ambient temperature conditions.

ESSENTIAL ACCESSORIES

- not supplied

Plastic feed and product tanks - capacity typically 30-50 litres. Floor standing

OVERALL DIMENSIONS

Height: 500mm

Width: 1000mm

Depth: 500mm

SHIPPING SPECIFICATIONS

Volume: 0.5m³

Gross weight: 40kg

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*Specifications may change without notice
iss6/5k/0304/B&S.*