Product name:	Product code:
Activated Sludge Process	NEECHL0252



Description

Activated Sludge Process

Technical specification

arising from the realization of an activated sludge process.
The unit is completely instrumented and arranged for the execution of tests that help to understand advanced problems which come from the modern conception of activated sludge plants such as: the agitation effect in the reaction tank; the energetic saving and the reliability of the sludge recirculating system by “air-lift”; the effect of the work oxygen concentration on the sludge elimination and sedimentation.
2. Composition
The pilot plant is composed of: Basic plant (Code 944500)
6-place BOD (Biological Oxygen Demand) meter (Code 994510); OPTIONAL
Frigothermostat for BOD apparatus (Code 949104); OPTIONAL Thermo reactor for COD analysis (Code 949103); OPTIONAL Electric compressor with 24 l tank (Code 971227); OPTIONAL OPTIONAL Automatic Data Acquisition System SAD/IC130D
composed of:
- Electronic transducers and signal conditioning kit (Code 914397)
- Data analysis and acquisition software (Code 914398).
3. Description Air line It is composed of:
a pressure stabilizing reducer; two flow rate controllers: one for the oxidation tank and the other for the sludge recirculation; a set of service solenoid valves an air distributor/diffuser in the reactor an “air-lift” system for the sludge recirculation from the settling tank.
The circuit can be supplied either by means of a compressor, or by an oxygen cylinder.
Liquid line
This consists of :
a feed preparation tank with stirrer;
a volumetric feed pump to study dilution D (Q/V) influence;
a cylindrical plexiglass reactor to allow the contact among the three phases: gas/liquid/solid;
a plexiglass settling tank with “air-lift”.
Control and regulation systems
The activated sludge pilot plant IC130D provides:
control of the concentration of O2 dissolved in to the oxidation tank by a sensitive element
measurer/indicator of O2;
regulator/actuator acting on the air flow sent to the tank; control to the feed mixture temperature;
control of the sludge quantity in the oxidation tank by sludge recirculation driven by a timer;
luminous mimic panel to follow the process in real time.
Measuring instruments
The pilot plant is provided with instruments to measure the quantities indicated below:
air flow rates sent to the oxidation tank and to the settling tank
sewage feed flow rate and temperature; pH in the reaction tank;
Quantity of dissolved O2.
Besides, by simple operations it is possible to measure the recycled sludge quantity and the purged sludge Quantity.
The following equipment is also provided with the unit: a cone to determine the percentage of sludge preset; a set of chemical products to recreate a favourable
environment for bacterial cultures; a quantity of lyophilized bacteria;
nitrate percentage detection papers; pH detection papers
4. Range of experiments
Determination of the purification effect according to the feed hydraulic stay time in the oxidation tank.
Determination of the purification effect according to the mixing. Evaluation of the effect at different concentrations of dissolved O2.
Determination of the sludge sedimentation varying the concentration of work O2.
Influence of sludge age. Influence of pH.

Efficiency of the purification according to the temperature. Influence of the activated carbon on the purification process. Tests using O2 instead of air.

5. Required services
Electrical supply: 220V – 50/60 Hz – 3 kW Compressed air supply: 800 l/h – 6 bar
Water supply: 200 l/h – 2 bar.
6. Dimensions and weights
Dimensions: with feed tank 2450 X 700 X 1700 h mm Net weight: 270 Kg
Pilot plant components
With reference to figure 1 the activated sludge sewage treatment plant IC130D consist of:

1. – feed tank with capacity 150 l
2. – fixed speed stirrer – 100 RPM, 90 W
3. – low level indicator
4. – feed cut-off valve
5. – feed discharge valve
6. – feed filter
7. – metering pump – capacity 0-20 l/h
8. – 1.5 l damper
9. – breather valve
10. – feed flow meter 60 l/h f.s.
11. – fowmeter activation valve
12. – fowmeter washing valve
13. – by-pass valve
14. – flowmeter washing
15. – flowmeter activation valve
16. – feed flowrate transducer (*)
17. – digital totalizer (*)
18. – 2000 W feed heater
19. – oxidation reaction tank – capacity approx 35 l
20. – 200 W variable speed stirrer
21. – pH measuring device
22. – reactor discharge valve
23. – digital temperature indicator-regulator
24. – digital dissolved oxygen indicator-regulator
25. – oxygenation flow meter 500 l/h f.s.
26. – oxygenation valve
27. – “air-lift” valve
28. – “air-lift” flow meter 500 l/h f.s.
29. – “air-lift” digital timer
30. – air/oxygen pressure reducer
31. – deactivated sludge discharge valve
32. – digital timer for deactivated sludge discharge
33. – sludge recovery with “air-lift”
34. – reactor discharge
35. – settling tank
36. – deactivated sludge collection tank
37. – clarified water discharge
38. – some computerized version components

39. – console and electric panel
Installation & Basic operational training

Activated Sludge Sewage Treatment Pilot Plant
1. General
The activated sludge pilot allows the study and the comprehension of sewage treatment by activated sludge.
This treatment is an intermediate stage between the physical treatments of gridiron, defoliation and primary sedimentation
And the final sterilization and chlorination stage, in a sewage treatment station. Its purpose is to eliminate the
contaminated

NAUGRA®
Civil Laboratory Equipment Manufacturers and Suppliers India Civil Lab Exportrs India
Email us at: export@civilmechanicalindia.com

Organic substances which are present in the sewage water after the above mentioned physical treatment.
The organic load is measured in BOD (Biological Oxygen Demand) unit and it also causes a partial elimination of COD (Chemical Oxygen Demand). The conditioning process takes place in a tank where the organic load is removed by microorganism (bacteria, rotifera, vorticellae, etc.) which are cultivated under aerobic conditions by blowing in air or sometimes also pure oxygen. The micro-organisms
utilize the contaminated substances as necessary food for their production and their preservation. The aspect for this mass of micro-organisms is that of sludge, from which we have taken the name of the
Process. After the pollutant elimination phase it is necessary to divide the clarified water from the sludge, operation which is
Carried out in the settling tank (stating separator).
The clarified water flows down to the receiving body, or to a sterilization treatment, while the activated sludge is partially recycled within the oxidation tank in order to stabilize the elimination treatment.
This pilot plant has been designed to enable the students to learn all the fluid-dynamic, chemical-physical problems