

## 1. Constant Temperature bath (CTB)



### Description

Make: Sigma Scientific Products

Temperature Range:  $-20\text{ }^{\circ}\text{C}$  to  $95\text{ }^{\circ}\text{C}$

Compressor: Hermetically Sealed

### Application

Constant Temperature Bath (CTB) is used for maintaining a pre-set bath temperature with an accuracy of  $\pm 1\text{ }^{\circ}\text{C}$ . Water and Isopropyl alcohol can be used as working fluids. Outer shell is made-up of PUF insulated stainless steel to prevent environmental heat loss. CTB is equipped with a PID control for quick response to bath temperature. Stirrer is mounted inside a bath, helping to maintain the uniformity of the bath. The temperature of the water can be maintained from  $5\text{ }^{\circ}\text{C}$  to  $95\text{ }^{\circ}\text{C}$  with a stability of  $\pm 1\text{ }^{\circ}\text{C}$ . This equipment is connected to the data logger and is used for experiments on the charging and discharging characteristics of Phase Change Materials (PCMs).

## 2. Biomass Pyrolyser



### Description

Make: Nano Tec

Model: NT/Pyrolyser/2L

Operating Temperature: 1000°C

### Application

Biomass Pyrolyser has a mild Steel Structure with powder coat painting. It has a thermocouple for temperature measurement. The pyrolysis process is carried out in the absence of oxygen with the supply of Nitrogen and the byproduct comes out to be bio-char. For each segment programming pattern is present that includes target temperature, time to reach the target temperature and power limit to the heater. Safety features are also present to prevent electrical current leakage and over temperature.

### 3. UV/Visible Reactor



#### Description

Make: The Precision Scientific & Co

#### Application

The UV/VISIBLE reactor consist of 10W, 15W and 30 W UV/VIS light source. The light source is placed inside the two glass bulbs whereas one bulb is filled with wastewater and other is provided for circulating cold water to remove heat. The reactor is of different volume of 300 ml, 200ml and 100ml. The main application of this reactor is treat the effluent with different light intensity to reduce the pollutant load.

#### 4. E-Waste Separator



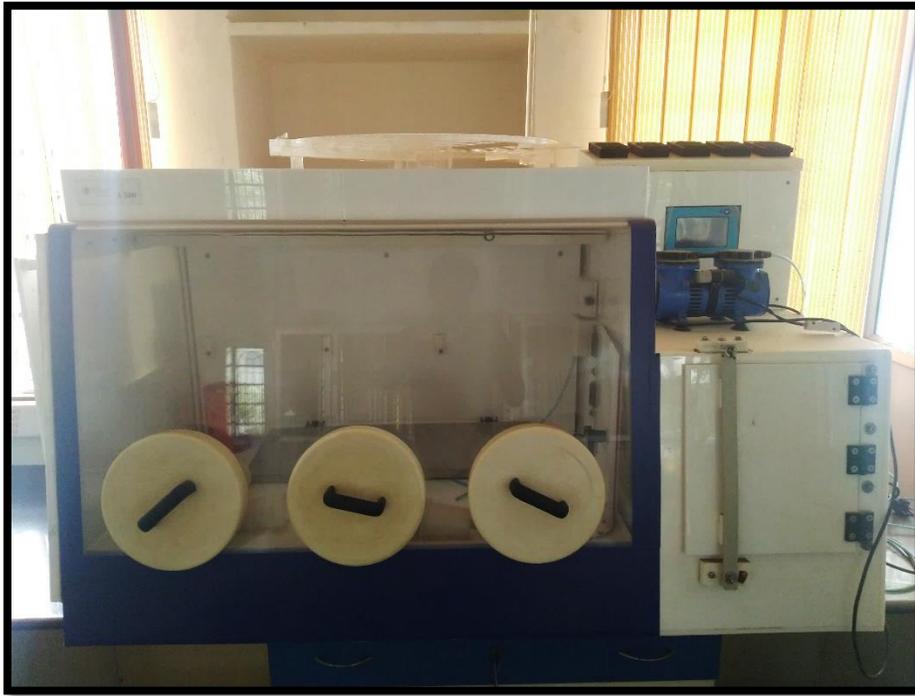
##### **Description**

Possible Metals: Copper, Zinc, Aluminum, Nickel, Lead and Tin.

##### **Application**

The principle of separation is based on the fact that the particles suspended in the gas, mostly air, move to different sections under the influence of different forces. Hence they get separated from one another. PCB particles experience drag and gravity force in opposite directions. Heavy particles possess terminal settling velocity larger than the velocity of air whereas lighter particles have terminal settling velocity smaller than the velocity of air. Hence heavy particles move downwards against the air stream, while the light particles rise along with the air stream to the top of the column.

## 5. Anaerobic Work Chamber/Station



### Description

Make: MSET A500

### Application

Anaerobic chamber is specially designed to maintain strict anaerobic condition within a controlled environment. It provides excellent conditions for processing, incubation and examination of various sample(s) without exposing it to the atmospheric oxygen. In general, the chamber has wider space to accommodate small intended equipment within. The chamber/workstation operates from two gas supplies for the most cost-effective operations. The chamber provides ideal conditions for anaerobic experiments/studies.

The chamber has built-in airlock system; internal HEPA filtration system; gas control system; and options for a box to introduce small quantities of sample and supplies, cable gland to accommodate power/data cable, data logging, internal storage tray, sample imaging system and anaerobic condition monitoring system.

## 6. IC Engine Test rig



### Description

Make: Kirloskar

Model: TV1

Rated Speed: 1500rpm

Power rating: 7hp

Compression Ratio: 17.5:1

### Application

The IC engine test rig consists of a single cylinder, water-cooled, four-stroke compression ignition diesel engine with suitable instrumentation to measure performance. The engine test rig consists of dynamometer, fuel consumption measurement, air flow measurement system, speed and load measurement systems including cylinder pressure sensor, crank angle sensor and temperature sensor. The experimental setup required for sensing various engine performance, installed at the appropriate points in the experimental set up. By using these instruments the basic quantities that were measured during the engine tests are engine speed, load on engine, consumption of fuel, crank angle, cylinder pressure, temperature of water inlet, cooling water outlet, exhaust gas and water flow rate.

## 7. Solar Simulator



### Application

Solar simulator is to duplicate the solar spectrum and beam characteristics with high-powered lamps and reflectors that can be used indoors. The simulator can then be used as a substitute for solar experiments when outdoor weather conditions are unfavorable or at night to increase the available testing time. This equipment comprises of Metal Halogen lamp (400W) attached with Aluminium dome having rough surfaces. It covers the area of 15cm\*15cm and by varying the distance between the object and lamp we can attain the solar radiation between 200W/m<sup>2</sup> to 700 W/m<sup>2</sup>. Some of the applications are Photovoltaic panel, solar thermal devices and Solar still where evaporation rate are analyzed.

## 8. Membrane Distillation (MD) Experimental Setup



### Application

In MD experimental setup, various size of MD module can be attached for its performance evaluation. The available AGMD module can hold 84 cm<sup>2</sup> hydrophobic membrane with a provision to change the air gap thickness from 2 to 12 mm. The temperature variation range of hot water stream is 40-80°C and 10-30°C for cold water stream. The flow rate can be varied from 0 to 3 LPM. The experimental can hold different modules such as DCMD, AGMD, SGMD, VMD, ME-MD, Vacuum enhance AGMD, LGMD etc.

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