

Experiment No.1 (OVENS)

Hot air ovens are electrical devices used in sterilization. They were originally developed by Pasteur. The oven uses dry heat to sterilize articles over several hours to destroy microorganisms and bacterial spores. Generally, they can be operated from 50 to 200 °C. It is found in hospitals and laboratories where medical professionals and laboratory technicians use it.





Items that are sterilized in a hot air oven include:

- Glassware (like petri dishes, flasks, pipettes, and test tubes)
- Powders (like starch, zinc oxide, and sulfadiazine)
- Materials that contain oils
- Metal equipment (like scalpels, scissors, and blades)

Parts of OVEN:

1. The body, made of aluminum alloy characterized by:

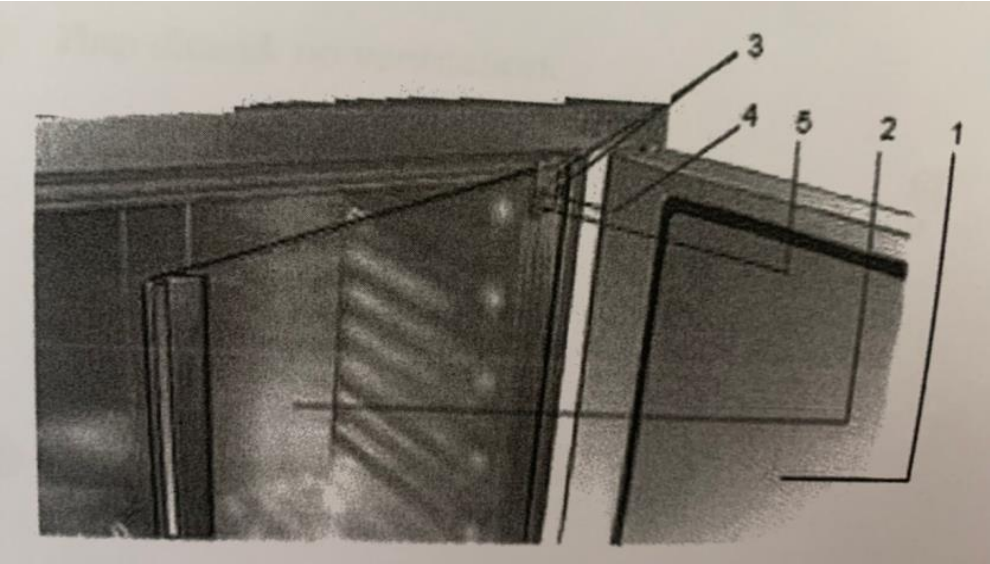
- ✓ Resisting the mechanical shocks, oxidation and corrosion.
- ✓ Rectangular shape to be easily placed.

2. The chamber (inner room): is double walled, inner layer made of aluminum alloy or stainless steel alloy and the outer layer made of fiber glass (as its name refer to the fiber of glass, the glass characterized with that it has very bad heat conduction, this is very suitable for heat insulation purpose).The inner room has ribs to put shelves in the wanted levels.

3. The shelves are plates on which the objects are placed, the number of it varying according to the oven capacity. characterized by:

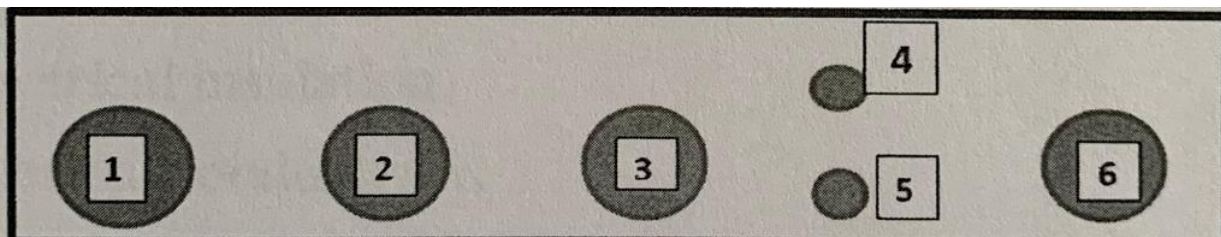
- ✓ Made of aluminum to resist oxidation.
- ✓ Some shelves have opening to allow the air movement.

4. Window (oven door): it is made of heat resistance glass



1-metal door 2-internal door (window). 3-bolts (adjustment)
4 -fixing screws (glass door) 5- inner door hinge upper

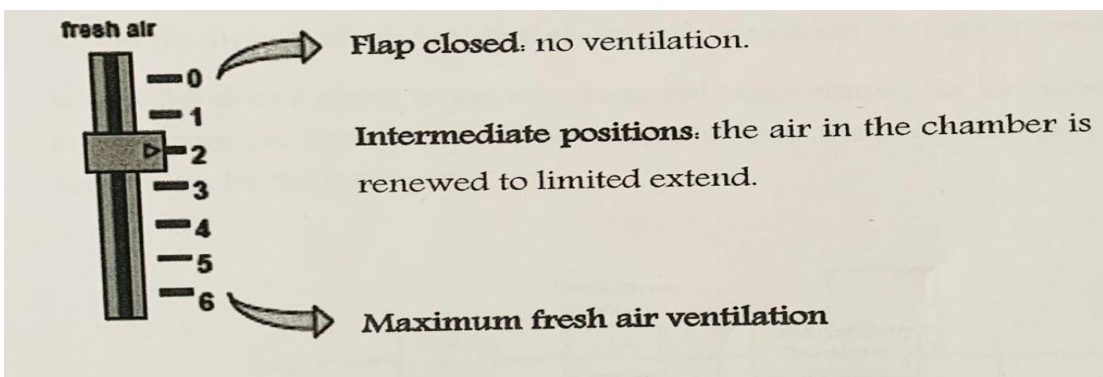
5. Control panel it is contain the following.



1-THERMOMETER: measures the temperature.

2-THERMOSTAT: used to select the wanted temperature of heating in range of (50 to 200 °C).

3-FRESH AIR VENTILATION.



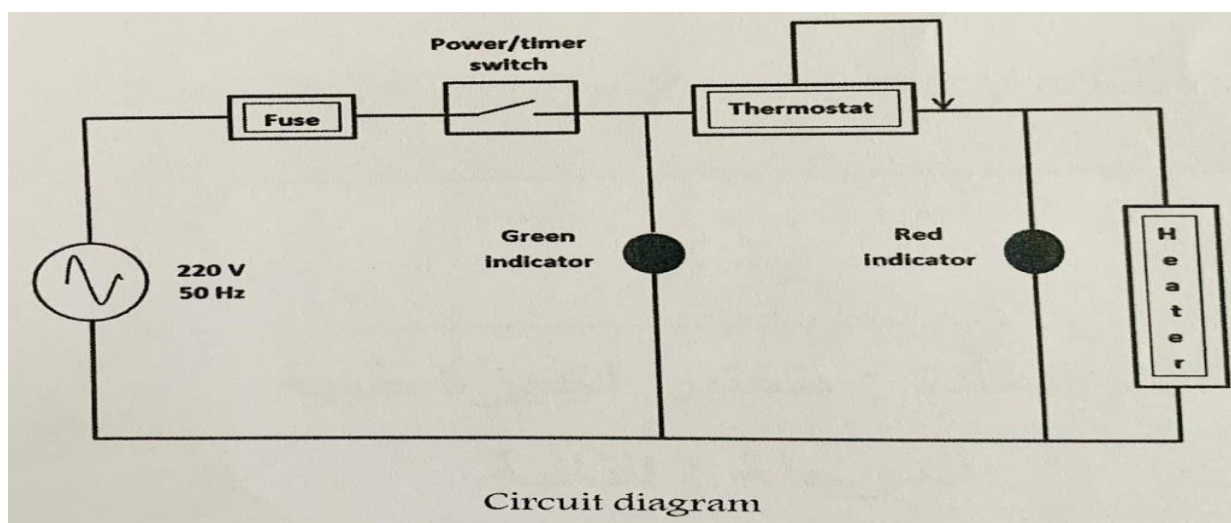
4-POWER INDICATOR. 5-HEAT INDICATOR. 6-POWER (timer).

6. The heater: the heating is produce by rising the temperature which release from passing electrical current through a conductor having a high current flow. The heater characterized by:

- ✓ High resistance.
- ✓ Electrical insulation.
- ✓ Thermal conductivity.

Circuit description

When the circuit supply by the electric energy (current), the current passes across the fuse to reach the thermostat for controlling the circuit operation. When the device reach to the over required temperature, the thermostat cut off the electric current from the heater. When decrease temperature, the heater slightly returns on by the thermostat.





Faults

- 1) Malfunction of the thermometer and thermostat.
- 2) Heater failure.
- 3) Timer malfunctions.

Discussion:

- 1) What is oven sterilization?
- 2) What are items can be sterilize by oven?
- 3) What are the common faults with the device oven?