

Incubators are used for the growth of microorganisms in many fields, including pharmaceuticals, agricultural, environmental, food, and industrial microbiology; public health; basic research; and education.

Two types of incubators are commonly used:

1. BOD incubators.
2. Bacteriological incubators.

The main difference between these two types of incubators is temperature.

Biochemical Oxygen Demand (BOD, also called Biological Oxygen Demand) is the amount of dissolved oxygen needed

– demanded – by aerobic biological organisms to breakdown organic materials present in a given sample at certain

temperature over a specific time period.

BOD incubators are normally rated in the range of 20°C to 60°C.

In Bacteriological incubators, the set temperatures are normally in the range of 10°C above ambient to 60°C.

Incubator

Incubator Is a device in which incubation process is done which conditions an enclosure to a predetermined temperature because it provides and maintains all artificial optimal conditions for growth of microbial culture.

What is Incubation

Incubation Is a period of time in which temperature, humidity and other environmental variables are provide desired temperature level for the growth and development of microbial culture.

Why we need incubation temperature and time

we all know every organism has a incubation period for growth and development if incubation is not provided it will definitely degenerate the growth of any organism so incubation is important aspect for the proper growth and development.

Principle and working of incubator :

incubator depends on the principle of thermo-electricity. The incubator has a thermostat which maintains a constant temperature by creating a thermal gradient. When any conductor is subjected to a thermal gradient, it generates voltage called as thermo-electric effect.

As power is supplied to the circuit predetermined temperature (37°C) is set in the incubator. This temperature is maintained by the compatibility operation of the temperature sensor, temperature controller and temperature contactor are major components. When the switch off, current flows into the system thereby energizing the contactor that powers the bulbs which serves as heating elements to the system, the fan ensures Distribution of hot air in the entire system.when the

temperature in the system gets to desirable(37°C) the digital temperature controller sends an electrical signal to contactor which de-energized thereby switching off the heaters temporarily. Also when temperature reduces beyond desire temp.the contactor will be energized again thus switch on the system.

In pharmaceuticals industry, there are two types of incubator are used :

1. Bacteriological incubator
2. BOD incubator

Bacteriological incubator:

This type of incubator is used mainly in laboratory usually for the growth of bacteria. it has a thermostat which maintains a constant temperature set according to requirement. Accurate temperature can be seen on thermometer fixed on incubator.

Most of the incubators are programmable which do not need trial and error temperature setting. This incubator has only heating system which maintains the temperature for growth of bacteria. These incubators are affected by temperature of surrounding environment because no cooling system is present.

Desirable Temperature and duration of incubation –

Between 30°C to 35°C for 48 hours (2 to 3 days)

BOD incubator (Low Temperature Incubator)

These types of incubators are often called low temperature incubator used for the growth of yeast and mold as they require low temperature to grow. This incubator is called BOD(Biological oxygen demand) because in biological oxygen demand testing there is need of low temperature around 20-25°C so don't confuse with term because purpose of BOD incubator is also same like bacteriological incubator. In BOD incubator there are both cooling and heating system that make it different from bacteriological incubator.BOD incubator are not affected by surrounding environment and are totally independent.

Desirable Temperature and duration of incubation-

Between 20°C to 25°C for 72 hours (3 to 5 days)

Calibration of incubators

Calibration done by performing temperature monitoring by using data logger with sensor.

Difference between BOD and Bacteriological incubator

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BOD incubator	Bacteriological incubator
<ul style="list-style-type: none">• Desirable Temperature : 20-25 °C	<ul style="list-style-type: none">• Desirable Temperature : 30-35 °C
<ul style="list-style-type: none">• Heating and cooling system are present.	<ul style="list-style-type: none">• Only heating system present.
<ul style="list-style-type: none">• External environment dependent.	<ul style="list-style-type: none">• External environment independent.
<ul style="list-style-type: none">• Temperature range : 5 – 60°C	<ul style="list-style-type: none">• Temperature range :10-60°C
<ul style="list-style-type: none">• Use for growth of yeast and mold	<ul style="list-style-type: none">• Use for growth of bacteria