Lec.5

What are the biosafety cabinet classes?

Biological Safety Cabinets, (BSCs), also known as tissue culture hoods, are designed to provide personnel, environmental and product protection when appropriate practices and procedures are followed.

Every BSC is categorized by a specific biosafety class: Class I, Class II or Class III.

- **Class I**

A Class I cabinet Class I biosafety cabinet is defined as a ventilated cabinet that provides personnel and environmental protection. Class I BSCs are designed with an open front with inward airflow (personnel protection) and **HEPA-filtered** (**high efficiency particulate air filter**) exhaust air (environmental protection). They pull room air through the front of the cabinet and across the work surface, away from the operator (similar to a fume hood), and use a HEPA filter at the exhaust outlet. They commonly recirculate air back to the laboratory, but can be externally exhausted if needed.

- **Class II**

A Class II cabinet is defined as a ventilated cabinet for personnel, product and environmental protection, often used for microbiological work or sterile pharmacy compounding. In some labs, these containment hoods are referred to as cell culture or tissue culture hoods. In pharmacy settings, these hoods are referred to as chemo hoods. Class II BSCs are designed with an open front with inward airflow (personnel protection), downward HEPA-filtered laminar airflow (product protection) and HEPA-filtered exhaust air (environmental protection).

- **Class III**

A Class III cabinet is defined as a totally enclosed, ventilated cabinet with leak-tight construction and attached rubber gloves for performing operations in the cabinet. These cabinets have a transfer chamber with interlocked doors that allow for sterilization of materials before entering/exiting the glove box. Materials can also be taken in and out through a dunk tank filled with a disinfecting solution. The cabinet is maintained under negative pressure and supply air is drawn in through HEPA filters. The exhaust air is treated with either double HEPA filtration or single HEPA filtration followed by air incineration and then exhausted outside.

Top 10 Lab Safety Equipment List

1. Lab gloves for students.
2. Safety goggles.
3. Eyewash.
4. Fume hood.

5. Disposable Masks.
6. Fire extinguishers.
7. First aid kits.
8. Lab coats.
9. Safety showers.
10. Safety storage cabinets.

Operating Instructions (in order):

• Start the unit allowing it to operate for 5 minutes.

• Wipe the unit down with a suitable disinfectant - if you use alcohol verify that no open flames are nearby).

• Place supplies in cabinet - to avoid arm movements in and out of the cabinet, plan your work and place all the supplies you will need for that particular experiment in the cabinet, making sure not to over crowd the work area.

• Use proper work techniques – work clean side to dirty side.

• Do not use open flames in the BSC. They create turbulence that disrupts the pattern of air supplied to the work surface. Use disposable sterile loops when possible. If absolutely necessary, small electric "furnaces" for decontaminating bacteriological loops and needles, or touch-plate microburners equipped with a pilot light providing a flame on demand may be used.

• After the work is complete allow the unit to purge for 5 minutes then wipe down again with suitable disinfectant- it is especially important that you turn off microburners or "furnaces" before this disinfection process.

• Shut the unit down.

Techniques to avoid contamination of yourself and your work:

• Always wear personnel protective equipment such as gloves and lab coat.

• Place materials in BSC before work starts.

• Work on center line of the work surface - this imaginary line is where the laminar down flow of air separates and is theoretically the best area to minimize contamination.

• If necessary use slow and deliberate motions into and out of the BSC.

• Keep front grills clear of any obstructions**.**

Points to consider:

• Adjust seat height so that the bottom edge of the sash is level with your underarms.

• If you use a UV light, be sure to wipe it down once per week (with light off). UV lights must be turned off when the room is occupied to protect eyes and skin from UV exposure.

• Always wear gloves to avoid contamination, and avoid resting arms on the front edge of the unit unless your unit is equipped with an armrest.