Biological Safety Cabinets
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Purpose

- Product protection
- Personal protection
- Environmental protection
**Biological Safety Cabinets**

**Types**

A. Class I
- *inward airflow protects worker*
- *exhaust to outside (w/wo HEPA filter)*

B. Class II
- *worker, product, environmental protection*
- *“sterile” work area*
- *use for work with aerosol-transmissible microorganisms*
- *use also for tissue culture/ virology*

C. Class III
- *totally enclosed, ventilated, air-tight*
- *suitable for work with BSL3/4 agents*
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Types

Class II

- Type A  30% exhausted to room
- Type B3  30% exhausted to outside
- Type B1  70% exhausted to outside
- Type B2  100% exhausted to outside
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Component

HEPA Filter

- “High efficiency particulate air” filter
- *Traps particulates only; chemicals, fumes, vapors pass through*
- *Traps particulates 0.3u*
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Component

HEPA Filter

- *Metal or wood framed*
- *Continuous sheet of flat filter medium with aluminum separators*
- *Gasket sealed*
- *Adhesive bond between filter pack and frame*
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Operating Location

- Isolated from other work areas
- Removed from high traffic areas
- Away from airflow ducts
- Away from laboratory entry doors
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Typical Class II

Airflow

Exhaust

Intake 100 ft/min
1. Load BSC with all needed supplies.
2. Turn BSC on and allow to run for 10-15 minutes.
3. Check inward airflow with a piece of tissue.
4. Enter straight into cabinet and perform work in a slow, methodical manner.
5. At end of work, decontaminate all items to be taken out of cabinet.
6. Decontaminate interior of BSC.
7. Allow cabinet to run for 10-15 minutes.
8. Shut off.
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Safe Operation

- Always enter straight into cabinet - no sweeping motions
- Place materials well within the cabinet - not on front grill
- Place discard pan within cabinet
- Watch for disruptions of laminar air flow
- Decontaminate materials before removal from cabinet
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Safe Operation

- Not designed for chemical use
- May use for non-volatile toxic chemicals or low-level radioactive materials
- May use for “minute” amounts of volatile chemicals
- Ensure annual certification
- Place all work materials into cabinet before starting
CAUTIONS

- **Chemicals may damage HEPA filter**
  - Exposure risk - chemical/infectious agents
- **Volatile chemicals NOT retained by HEPA filter**
  - Exposes personnel if not exhausted
- **BSC fans NOT spark proof**
  - Chemical use may result in fire/ explosion
  - Never use NFPA 4 flammables