Clean Air & Containment Decision Map

For Research Labs

IMPORTANT: Prior to making a final decision, a risk assessment for the laboratory space should be prepared by, for example, the institution's Biological Safety Officer.

BAKER

START HERE

Are you working with a biohazard (Virus, bacteria, fungi or other biohazard)?

YES

Are you also working with a chemical hazard?

NO

What is your lab's BSL designation?

BSL 3*, 3+, 4

* Under special circumstances, see Biosafety in Microbiological and Biomedical Laboratories on the CDC website.

With a positive protection suit

A2 - Vent to Room

There may be future requirements for solvent, gas or volatile toxic chemicals use that would require exhaust to the outdoors. Also, some researchers may prefer the extra margin of safety that exhausting to the outdoors provides.

Class III Glovebox

Variables including such things as the severity of a biohazard, the amount being used, and the possibility of mass aerosolization may dictate the use of a Class III biological safety cabinet. Class III biological safety cabinets are a special type of glovebox. Not all gloveboxes are safe to use with biohazards.

BSL 1, 2, 3

A2 - Vent to Room or Canopy

Canopy exhaust connection is required when using any amount of toxic or flammable gases and volatile solvents (which create gases or vapors). Since these gases and vapors pass through HEPA filters, they need to be exhausted to the outdoors.

YES

HEPA filters do not capture gases and vapors. When they are used, the cabinet needs to exhaust to the outdoors.

Is the chemical hazard a solid, liquid or gas?

Solid

Solids can infiltrate the cabinet ducts and plenums. It is best to filter them immediately.

Some solids can sublime (transform from a solid to a gas) easily. Consult MSDS sheets (or other literature) for chemical properties.

B1 (40% recirculated)

Liquid

Is it volatile?

YES

Volatile liquids create gases which pass through HEPA filters.

A2 - Vent to Room or Canopy

NO

Are you working with animals?

YES

A2 - Animal Transfer Station

NO

A2 - Canopy (60% Recirculated)

Gas

Is it flammable?

Flammable gases are particularly hazardous with recirculating cabinets. Concentrations could build to the lower explosive level (LEL).

NO

Chemical Fume Hood

YES

What amount are you working with?

Small

Trace amounts only

B1 (40% Recirculated)

A B1 cabinet can be used when working with small amounts of volatile or flammable substances more frequently, or for trace amounts of more hazardous gases.

Large

Consider the effects of recirculated gases on the work being performed.

B2 (100% Exhausted)

Consider modifying your protocol to isolate the gaseous hazard to a fume hood. If you use a biosafety cabinet, only bring into the cabinet the amount of flammable solvents or chemicals necessary to perform the task. Never store chemicals in a biosafety cabinet.

Biosafety cabinets provide a sterile environment.

NO

Are you working with a chemical hazard?

YES

Do you also need a sterile environment?

YES

Chemical fume hoods offer personnel protection from chemical hazards only. Biological hazards should never be used in a chemical fume hood.

NO

Chemical Fume Hood

NO

Do you also need a sterile environment?

NO

Open Bench

YES

Are you working with animals?

YES

Animal Transfer Station / Clean Bench

Clean bench animal transfer stations provide product protection and some personnel protection and aid in animal dander removal.

NO

Clean Bench

With NO human hazard (chemical or biological), a clean bench can provide product protection from contaminants. Please note that the operator will be exposed to all work done in a clean bench.

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