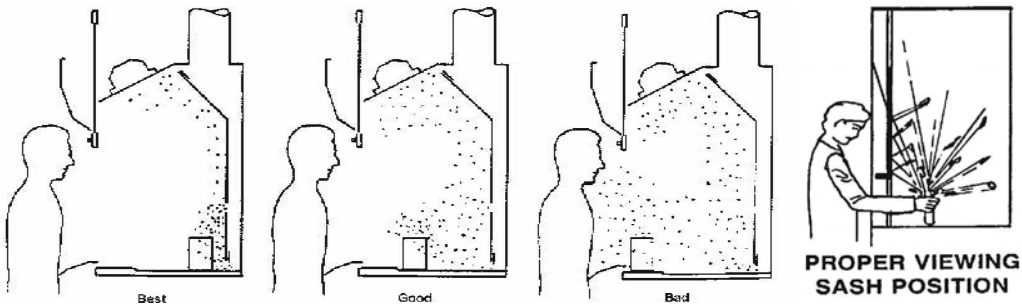
Use of the Laboratory Fume-hood

Why do we use a fume-hood?

Inhalation is a major route of entry of chemicals into the body. Chemical fumes and vapours can directly enter our bloodstream and small particles can lodge in the alveolar region of our lungs. A properly designed and operated fume-hood reduces exposure to hazardous fumes, vapours, gases and dusts. A fume-hood confines hazardous airborne material by diluting it with a large amount of air, drawing it through an exhaust system and then expelling the air in vents locate on the roof of building 18. Proper use of the fume-hood sash can also shield the worker from an uncontrolled reaction. Fume hoods are inspected and tested annually to assess performance standards but it is up to you to use a fume-hood safely.

Using a fume-hood correctly

- Perform all work involving hazardous or volatile materials in a fume hood.
- Check that the fume-hood is operating correctly before you start work. To check the air flow a strip of paper, tissue, or ribbon can be taped to fume-hood sash.
- Avoid cross drafts and disruptive air currents in front of the fume hood. Ensure that windows and doors near the fume-hoods are CLOSED.
- Always keep work at least 15cm in from the opening of the fume hood.

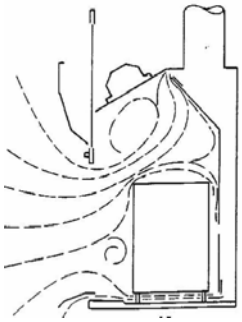


Images from www.ehs.washington.edu/fsofumehoods/fume.shtm [accessed Apr 2009]

- Use the sash as a safety shield when boiling materials or conducting an experiment with reactive chemicals.
- Always keep sash as low as possible. As the sash is lifted, flow is increased so that the face velocity of air over a given cross section of the sash opening is constant. In summer especially, this will mean that more hot make up air is drawn into the lab.
- When the fume hood is not in use, ensure that all materials are in sealed containers.
- Connect all electrical devices outside of the hood to avoid sparks which may ignite a flammable or explosive chemical.
- If the fume-hood is alarming or not functioning correctly please call the Buildings and Grounds Service Centre on extn. 3217 to arrange repair and immediately report to Sandra Chapman (X3473, mob. 0418 609792) or John Korth (X3513). Note that after a power outage some fume-hoods in Building 18 switch off and need resetting by qualified staff.
- Prepare a plan of action in case of an emergency, such as a power failure, especially when using extremely hazardous chemicals or acids.
- For long term experiments fill out the overnight/ unattended experiment form and post on sash of fume-hood. These can be downloaded from http://www.uow.edu.au/science/chem/ohs/index.html

DON'T

- DO NOT place your face or head inside the hood. Keep hands out as much as possible.
- DO NOT use a fume hood as a storage area, they should contain only working volumes of chemicals.
- DO NOT use fume hoods to vent or dispose of hazardous materials through air dilution.
- DO NOT overcrowd or clutter the fume hood. Overcrowding creates vortices and dead spots. Vortices may cause hazardous material to flow back out of the fume hood causing exposure; dead spots may allow ignitable concentrations of flammable and combustible materials to accumulate; Large bulky equipment used in the hood will cause eddies. These can be reduced by making sure there
- DO NOT place equipment in the hood that stops the sash from closing. A safer local exhaust ventilation method may exist and should be pursued.



- DO NOT modify fume hood or erect shelves in a fume hood for chemical or equipment storage.
- DO NOT place power boards, or other spark producing sources inside the hood.

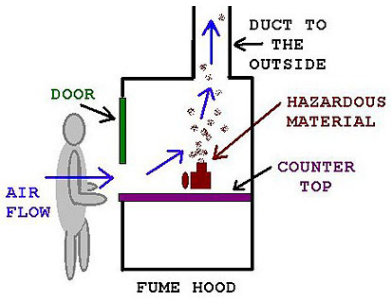
How does a fume-hood work?

Fume-hoods draw air out of the rooms they are installed in. There needs to be an adequate volume of air available or the fume-hood will not be able to draw a sufficient volume of air to function properly. Where the room is small or there are a large number of fume-hoods an additional supply of air, other than the normal room ventilation, may be required. This additional air is known as the make-up air. If the make-up air supply is not adequate or the make-up air is switched off then the fume-hoods may not be able to achieve the required face velocity. This can cause fumes to escape in to the laboratory.

There are special fume hoods for perchloric acid and radioisotopes. Ensure that the appropriate hood is used for each specific reaction or process involving specific chemicals. There are also different types of hoods to for biological samples.

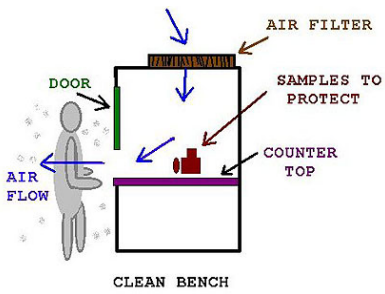
FUME HOODS

Protect you from fumes you are working with. The fan sucks in the air toward the duct inside of the fume hood towards the outside. This system works only if you bring the hood's door down at least 2/3 of the way. The narrower the opening, the swifter the air.



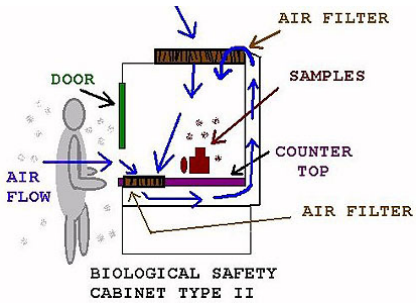
LAMINAR FLOW Cabinets

Protect your ***samples*** from contamination coming from you and the room. The air is blown at you.



BIOLOGICAL SAFETY CABINETS type II

Protect ***you, your samples and your environment*** from particulate contamination. They are ***NOT*** designed for harsh or radio-labelled chemicals. To be used for work with low to moderate risk agents ***NOT*** with high-risk pathogens. HEPA (High Efficiency Particulate Air) is the essential component of these cabinets.



Images from biology.mcgill.ca/safety/handling.htm [accessed Apr 2009]