Laboratory Fume Hood Guidelines

Overview:

A laboratory fume hood is a ventilated enclosure that captures, contains, and removes hazardous airborne contaminants from the laboratory. Fume hoods are often the best engineering control available to minimize chemical exposure in the lab.

When used properly, fume hoods can protect you from inhaling chemical gases, vapors, and aerosols. They also serve as a physical barrier and provide some splash protection from the hazardous materials in the hood. Principal Investigators or Laboratory Supervisors should provide hands-on training in how to operate fume hoods in your laboratory.

General Guidelines:

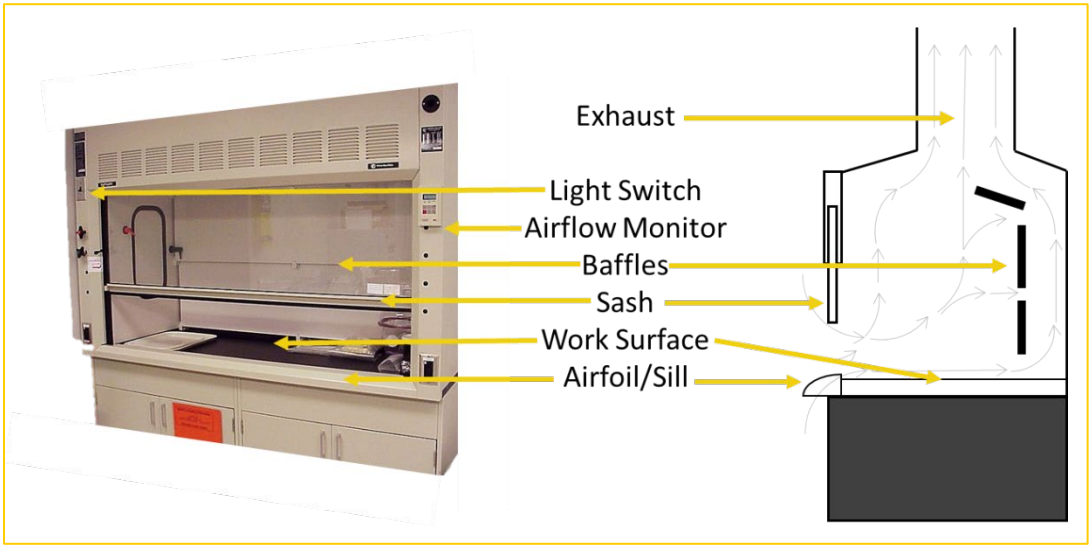
Before using a laboratory fume hood:

- Ensure that you have been properly trained and understand the uses and limitations of the laboratory fume hood.
- Know the hazards of the chemicals you are working with and use a fume hood when handling hazardous chemicals to minimize your exposure to hazardous fumes, vapors, gases, or dusts.
- Ensure that the fume hood is on.
- Check the inspection sticker and airflow monitors to ensure that your fume hood has been inspected routinely and is functioning properly.
- Do not use the hood if the airflow alarm is sounding, the airflow monitor indicates low flow, the sash or baffles are damaged, or the hood has been posted out of service.
- Do not use a fume hood that is not working. Call the Safety Office if the hood is not working, and post a sign stating “Hood needs repair, Do not Use”

When using a laboratory fume hood:

- Keep hazardous materials at least 6 inches inside the hood.
- Work with the sash in lowest possible position and close the sash when not in use.
- Do not put your head inside a fume hood.
- Keep fume hoods clean and do not obstruct airflow into the hood or baffles.
- Minimize rapid movements in and out of the hood.
- Do not store excess chemicals, large equipment, or clutter in a fume hood.
- Do not attempt to modify or repair a laboratory fume hood.
- Do not use a fume hood to evaporate hazardous waste.
- Do not use a chemical fume hood for work requiring biological containment.
- Remember that specialized hoods are required for use of perchloric acid, hydrofluoric acid, nanomaterials, and radioactive materials.

Laboratory Fume Hood Components:



Laboratory fume hoods work by drawing potentially contaminated air from the lab in through the opened face on the front of the fume hood cabinet and exhausting the contaminated air out through openings in the rear and top of the cabinet.

Components:

- **Exhaust Duct:** Contaminated air is removed from the hood via the exhaust.
- **Light Switch:** On/off control for lights in the fume hood.
- **Airflow Monitor:** Device on the outside of the hood that indicates airflow.
- **Baffles:** Movable partitions along the back wall of the fume hood that maintain uniform airflow.
- **Sash:** Glass/plastic window that opens and closes.
- **Face:** Exposed area when the sash is open to allow lab air into the fume hood.
- **Airfoil/Sill:** Guides air smoothly into the hood to reduce turbulence.
- **Work Surface:** Laboratory bench inside of the fume hood.

Types of Laboratory Fume Hoods

There are a variety of fume hoods on campus, and it is important to understand how your fume hood operates to keep you safe. There are two types of fume hoods:

Constant Air Volume (CAV) Hood:

- CAV fume hoods exhaust the same amount of air all of the time, regardless of the sash position.

Variable Air Volume (VAV) Hood:

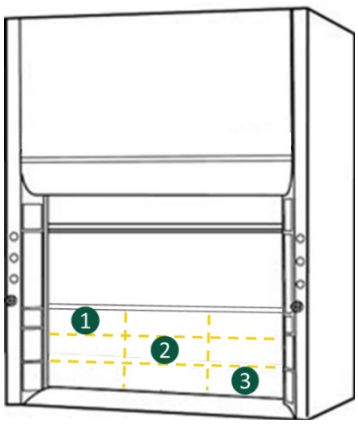
- VAV fume hoods modulate the air flow based on sash height to maintain a constant air velocity at the face of the hood

Fume Hood Testing and Certification

The Safety Office annually inspects and tests all NDSU laboratory fume hoods by measuring face velocity with the sash raised 18 inches. The face velocity is a measurement of the speed at which the air enters a fume hood's face opening and is recorded in feet per minute (fpm). NDSU uses an acceptable face velocity between 80-125 fpm with the sash opened 18 inches.

Hood Face Velocity Measurement Procedure:

1. Ensure the fume hood is on.
2. Open the hood sash 18 inches.
3. Take three air velocity measurements diagonally across the face of the open hood (see image right).
4. Take the average of the three measurements. The acceptable velocity range is between 80-125 fpm.
5. All fume hoods that are found to need repair will be immediately reported to Facilities Management (FM). FM will contact departments for funding information for costs associated with repair and maintenance services.
6. When notified of scheduled inspection, maintenance, certification, or repair, laboratory personnel must remove chemicals, glassware, and equipment; stop active processes; wipe down interior surfaces and the sash; and ensure the area around the hood is clear and accessible.



Fume Hood Testing Data is Available on Chimera:

1. Locate the barcode sticker on your fume hood. This is typically placed on the front of the hood or near the airflow indicator.
2. Visit **Chimera**. Enter the barcode number from your fume hood sticker into the search field.
3. Chimera will display the latest testing data for your fume hood, including airflow velocity. If you need additional data, historical performance, or have specific questions regarding the fume hood's performance contact the Safety Office.

If you suspect your fume hood is not operating properly, contact the Safety Office immediately at 701-231-7759.