

# 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:

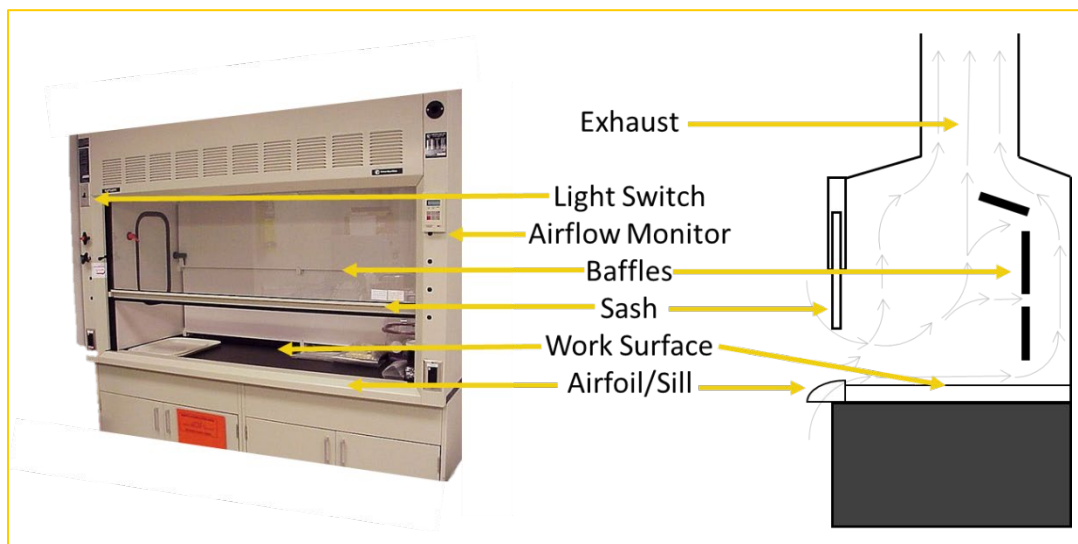
### Before using a laboratory fume hood:

- 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 a fume hood that is not working. Call 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 biohazard material in a chemical fume hood.
- 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:

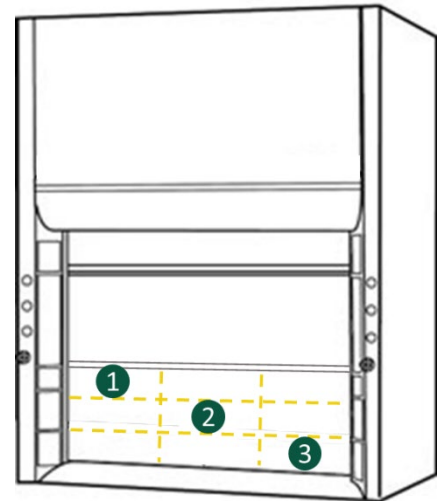
- VAV fume hoods modulate the air flow based on sash height to maintain a constant air velocity at the face of the hood

## Fume Hood Testing and Certification

The Safety Office annually inspects, tests, and certifies all NDSU laboratory fume hoods. A certification sticker on your hood will indicate the most recent certification date, and the measured 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). Face velocity should always be between 80-125fpm.

### 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 80-125fpm.



### Fume Hoods Operating Outside of 80-125fpm:

1. If the fume hood is used for research purposes, the department who owns the fume hood will be contacted. Departments are responsible for approving funding for fume hood repairs in research laboratories.
2. If the fume hood is used for educational purposes, Facilities Management should be contacted to conduct repairs.
3. If a department prefers a hood face velocity outside of the acceptable velocity range, the fume hood must pass a smoke test at the desired face velocity.

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