

## **STANDARD OPERATING PROCEDURE**

### **Laboratory Chemical Fume Hoods**

#### **Introduction**

A properly functioning chemical fume hood is one of the most important pieces of laboratory safety equipment. A chemical fume hood can protect lab personnel from inhaling chemical fumes by constantly pulling contaminated air into the hood and exhausting it out of the building. It can also protect users in case of a fire or explosion by helping to physically contain the event.

Chemical fume hoods, while typically classified as engineering controls for air quality, can also be considered as a form of personal protective equipment. Making proper decisions about when fume hoods should be used, and then using them correctly, should be part of your planning for every experiment.

To achieve the maximum operator protection, you must use chemical fume hoods only for the application for which they were designed. Do not use chemical fume hoods for biological work, radioisotopes, chemical storage, spray painting, or any operation incompatible with materials used in the fume hood construction. For information on these non-chemical fume hood operations, refer to the UT Arlington [Laboratory Safety Manual \(Chemical Hygiene Plan\)](#), the UT Arlington [Biosafety Manual](#), or the UT Arlington [Radiation Safety Manual](#).

Laboratory fume hoods are often the primary control device when using toxic and flammable chemicals in a laboratory. It is important for lab personnel to understand how chemical fume hoods operate so they can use them correctly and avoid undue exposure to hazardous materials. All chemical fume hoods work in the following way:

- Air is drawn through the front opening of the fume hood, across the work surface, and through one or more baffles at the rear of the hood;
- Air flows up through the ductwork and into the blower, which should be located on the roof;
- Air flows through the exhaust stack and into the atmosphere, away from the building and any air intakes.

#### **Fume Hood Testing**

The Environmental Health and Safety Office (EH&S) tests laboratory fume hoods semi-annually. Face velocity is a measurement of the average velocity at which air is drawn through the fume hood face to the hood exhaust. The minimum face velocity is 100 ft/min and the maximum is 125 ft/min. You can test airflow yourself by taping small

pieces of tinsel or Kimwipes to the bottom corner of the sash. Inward movement of the tinsel or Kimwipes indicates that the fume hood is drawing air inside. Airflow indicators do not determine airflow rate. They only indicate that air is being exhausted through the fume hood.

### **Safe Use Procedures**

Properly functioning fume hoods help achieve personnel safety with respect to the hazards of chemical vapors and other harmful airborne substances. Remember that a fume hood is not a storage area. Keeping equipment and chemicals in the fume hood unnecessarily may cause airflow blockage. Here are a few health and safety tips concerning fume hoods:

- Verify the exhaust system is operating before each use.
- Substitute toxic chemicals with less hazardous materials whenever possible.
- Keep fume hood exhaust fans on at all times.
- Fume Hoods equipped with a combination vertical and horizontal sash are intended to be used primarily with the vertical frame down and the horizontal moving panels open. Never raise the sash vertically without closing the horizontal panels first.
- Perform all work at least six inches (15 cm) inside the fume hood.
- Do not block airflow. Raise large objects 2 inches (5 cm) off the counter by placing them on blocks. This allows airflow underneath and prevents stagnant areas.
- Never place your head inside the fume hood. No part of your body except your hands and forearms should ever be inside a fume hood. Leaning into the hood to obtain a better view places your face in closer proximity to the experiment and is particularly dangerous.
- Keep the fume hood sash closed as much as possible at all times to ensure the optimum face velocity and to minimize energy usage.
- When working in the fume hood keep the sash pulled down to no more than 18 inches (46 cm) above the work surface. Use the sash as a shield.
- Keep lab doors closed to ensure negative room pressure to the corridor and proper airflow into the hood.
- Do not store reagents or equipment in the fume hood. You must keep fume hoods uncluttered. Remove the equipment from one experiment before preparing another.
- Keep the slots of the baffle free of obstruction.

- Avoid rapid movements in front of or inside the fume hood, including opening and closing the sash rapidly and swift arm and body movements. These actions may increase turbulence and reduce the effectiveness of fume hood containment.
- Do not override or disable mechanical stops on the sash.
- Train and educate personnel regarding specific hazards and include work methods that help reduce contaminant exposure.
- Have a general awareness of the operation of your fume hood and be aware of any differences in visual or audible cues that may imply a change in function.

### **Fume Hood Alarms**

Your fume hood may be equipped with a suitable low flow alarm. The low flow alarm is designed to protect you from exposure to hazards by sounding when low face velocity is detected. Do not mute the alarm or otherwise defeat its operation. Such alarms may be factory supplied, purchased, and calibrated separately.

When the alarm sounds, immediately close the sash and step away from the hood. If the alarm does not reset itself, evacuate the area and contact the Facilities Management (FM) call center at 817-272-2000 to submit a work order. There may be a malfunction in the exhaust system serving that hood.

Under certain circumstances, it may be necessary to raise the sash above the established working height to allow materials and apparatus to enter the fume hood. In this case, wait two minutes after all hazard-generating activity has ceased and all containers of materials are tightly closed. You may then raise the sash as high as needed to setup operations. During this time only it is safe to temporarily mute the alarm by pressing the enter button.

### **References**

<http://www.fume-hoods.us/>

<http://www.uta.edu/campus-ops/ehs/chemical/docs/lab-safety-manual.pdf>

<http://www.uta.edu/campus-ops/ehs/radiation/docs/radiation-safety-manual.pdf>

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