

Fume Hoods

Fume hoods are the primary direct ventilation device found in research labs and they serve a vital role in reducing exposures to airborne hazards. Unfortunately, they are also one of the most misused pieces of laboratory equipment and often represent the largest source of wasted energy in the laboratory environment. To attain the most benefit while minimizing waste, fume hood sashes must be kept closed as much as possible, working surfaces must be kept free of clutter and obstructions, and the fume hoods must be periodically tested and maintained in good working order.

Properly functioning hoods keep contaminants away from users by drawing conditioned air from the laboratory space through the hood sash opening and then discharging all of this air directly out of the building through the roof exhaust. This is simple and can be a quite effective but the fragility of this strategy is easy to appreciate if you consider that an average hood face velocity of 100 fpm corresponds to only a 1.13 mile per hour (mph) air current. This level of air flow can easily be impacted by vortices created by airflow obstructions, rapid motions by hood users or even by a person walking near the hood at a normal walking pace of 2 to 4 mph. These vortices can create swirling air patterns at the hood face that can draw contaminants generated within the hood back out into a user's breathing zone. Chemical fume hoods, and other direct ventilation devices, need to be located away from general supply ventilation duct diffusers, doors or other such openings that could introduce turbulence and interfere with their operation. To minimize this type of potential problem and maximize protection always:

- Ensure that air is entering the hood normally without excess turbulence before beginning operations. Use visual cues such as a tissue taped to the bottom edge of sash to observe air flow patterns.
- Remove any obstructions from inside or near the hood that are not necessary for the operations being conducted and use stands to elevate any bulky equipment that must remain in place inside the hood.
- Ensure the internal baffles are not blocked and are positioned as they were initially installed and tested or as recommended for your use.
- Place all materials and conduct operations at least six inches behind the sash inside the hood where the air flow will be more stable.
- Keep the sash below the specified maximum horizontal working height and keep all sashes closed or adjusted with the smallest opening possible to ensure containment and protect personnel from flying debris that may result from accidents.
- Keep the hood clean and uncluttered. Clean up all spills immediately to prevent cross-contamination and degradation of the hood surfaces and other contained equipment.
- Always close hood sashes when not actively using the hoods in order to provide maximum containment and conserve energy.

Fume hoods are checked annually by EH&S personnel. The velocity of the air at the face of the hood is measured with the sash at the level of the maximum working height stops, or fully open if no stops are installed, and the results of this test are posted on a label attached to the front side of the hood face. This label indicates the maximum safe sash working height allowed for that hood, the flow rate, test date and the initials of the person that completed the test. Users should never perform work in a hood that does not have a current label. Hoods that do not meet the exhaust requirements during EH&S inspections are posted "Out of Order". EH&S personnel will notify Facilities via a Work Order request that hood maintenance is needed. To check the status of a Work Order for a fume hood, contact EH&S

or your department Facilities Liaison Officer. Once repairs have been made, EH&S personnel will ensure that the fume hood is working properly and certify it accordingly. Do not use a fume hood that is tagged "Out of Order" and do not remove any tags without consulting EH&S.

Fume hood alarms indicate substandard operation of fume hood exhaust. The fume hood alarm will indicate an exhaust flow malfunction with an audible and visual signal. If the fume hood is in an alarm condition, close the sash and notify Facilities by calling 850-644-2424 or submitting a Work Order request online at www.facilities.fsu.edu. Do not use the fume hood until repairs have been made and EH&S has retested the fume hood to ensure that it is properly functioning.

Ductless Fume Hoods

Ductless fume hoods should never be used for work with hazardous chemicals or materials, as they offer very limited and unreliable protection to personnel or the environment. Contact EH&S prior to purchase or installation of any ductless fume hood.

Perchloric Acid Fume Hoods

When perchloric acid is heated above ambient temperature, vapor is formed which can condense in the ductwork and form explosive perchlorates. Standard fume hoods must never be used for work that involves heating perchloric acid above ambient temperature; specially designed perchloric acid fume hoods must be used. The acid hood must be labeled clearly and used only for perchloric acid or work with other mineral acids such as nitric, hydrochloric and hydrofluoric acid. No organic solvents shall be stored or used in any designated perchloric acid hood. The hood and ductwork must be washed down after each use. Contact EH&S for more information.

Radioisotope Hoods

Many reference documents and policies from other institutions specify a 25% increase in face velocity, stainless steel interiors and/or HEPA filtration in the exhaust ducts for any work involving radioactive materials. These criteria have proven to be unnecessary and problematic for most of the types of use and materials that have historically been performed at our University. Work with long-lived isotopes in conjunction with strong oxidizers or corrosives over long periods have caused extensive corrosion to stainless steel hood surfaces. Products bound to corroded areas cannot easily be decontaminated. These surfaces are seamless and welded together so that parts cannot be replaced and sections cannot be individually cut out or disassembled for easier subsequent disposal. Standard fume hoods with surfaces that are easy to decontaminate, disassemble or machine are preferred. HEPA filters would only be required for very long-lived isotope use. The FSU Radiation Control and Policy Committee must approve the use of and all specific work areas for radioactive materials and will provide specific guidance to users prior to commencement of such operations.

Biohazardous Materials and Fume Hoods

Fume hoods are used to protect the individual from exposure to chemicals and gases. Fume hoods are **not** equipped with HEPA filters. **Biohazardous materials must not be used in fume hoods.** Work with biohazardous materials must be done in a [Biological Safety Cabinet](#).

Additional Information and Resources

- [Ductless Fume Hood Review](#)
- [Perchloric Acid Safety](#)