



October 2011 Safety Topic of the Month

Fume Hoods

Applicability

Fume hoods are the most important component used to protect laboratory personnel from exposure to hazardous chemicals and agents. Functionally, a standard chemical hood is a fire- and chemical-resistant enclosure with one opening (face) in the front with a moveable window (sash) to allow user access to the interior. Large volumes of air are drawn through the face and out the top into an exhaust duct to contain and remove contaminants from the laboratory.

The determination that a fume hood is necessary for a particular experiment should be based on a hazard analysis of the planned work. Such an analysis should include:

- A review of the physical characteristics and toxicity of the materials to be used;
- The experimental procedure;
- The toxicity and volatility, if flammable of the materials present during the experiment;
- The probability of their release;

Use

- Keep chemical fume hood exhaust fans on at all times. (If the hood does not have an alarm, a telltale can be used to provide a visual signal that the hood is working)
- If possible, position the sash so that work is performed by extending the arms under or around the sash, placing the head outside the sash, and keeping the sash between the person and the chemical source. View the procedure through the sash as it acts as the primary barrier if a spill, splash, explosion, or fire should occur.
- Avoid opening and closing the sash rapidly and avoid swift arm and body movements in front of or inside the hood to minimize turbulence. If there is a hood alarm, rapid movements of the hood window sash may cause the alarm to sound.
- Keep chemicals and equipment at least 6 inches back from the edge of the hood to minimize the concentration of chemicals in the breathing zone. Make sure equipment is positioned so that it does not interfere with the closing of the sash.
- Separate and elevate equipment by using blocks or racks so that air flows easily around all apparatus. Do not block the rear of the hood, this will prevent air from exhausting properly.
- Do not use large pieces of equipment in a fume hood because they tend to cause dead spaces in the air flow and reduce efficiency
- Do not modify hoods in any way that adversely affects performance.
- Keep the sash closed whenever the chemical hood is not actively in use or is unattended.
- Keep fume hoods and adjacent work areas clean and free of debris at all times. The hood will have better airflow across its work surface if it contains a minimal number of bottles,

beakers, and laboratory apparatus, keep unnecessary equipment and glassware outside the hood.

- The face opening should be kept small to improve the overall performance of the hood. The sash should be positioned to produce the recommended face velocity. The maximum height of the sash is marked on the hood.
- Wear appropriate eye protection, gloves and other personal protective equipment when working with hazardous chemicals in the hood.
- Ductless hoods filters must be monitored and changed out as specified by the manufacturer.. Use only the chemicals which were pre-approved by the manufacturer prior to purchase. Maintain a run-time log of chemicals used. Package and label the spent filters as hazardous waste.
- Work involving harmful microorganisms should be done in a biosafety cabinet, rather than a chemical fume hood
- When working with highly dangerous substances needing more containment than a fume hood offers, consider using a glove box.
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Discussion Topics

- 1) Does this lab/shop need a fume hood or other type of local exhaust ventilation? Contact EHS for assistance if you are unsure what type is needed.
- 2) Has the fume hood been tested within the past 12 months? There should be a sticker on the fume hood indicating the date the hood was last tested.
- 3) Is the fume hood being used properly?
 - a. No excess material stored in the hood
 - b. Sash is kept as low as possible during use
- 4) Are there any operational issues with the hood? If the hood is not ventilating properly, submit a work order to Facilities Services to have it repaired. The hood should be not be used until the problem has been corrected. Post a sign if the hood is malfunctioning or out of service. Contact EHS for assistance in evaluating hood performance.

References

Prudent Practices - http://www.nap.edu/catalog.php?record_id=12654