

Industrial Hygiene: Hazard Control Ventilation Requirements

Department: Chemical and General Safety

Program: Industrial Hygiene

Owner: Program Manager

Authority: ES&H Manual, Chapter 5, Industrial Hygiene¹

Ventilated Laboratory Hoods

A ventilated laboratory hood is a local hazard control ventilation device designed to protect workers from the hazards of airborne contaminants. Hoods also help protect people and property against small fires and explosions. (For an inventory of ventilated lab hoods at SLAC, see “Ventilated Lab Hoods”.²)

Other Hazard Control Ventilation Systems

Other hazard control ventilation systems, such as those in use in the electroplating, welding, and paint shops, are evaluated by the industrial hygiene program manager for adequate contaminant control as part of a periodic survey. Other ventilation systems may include soldering bench hoods, extractor arms, glove boxes, and biological safety hoods or cabinets.

Surveys

The industrial hygiene program manager conducts annual surveys of the use and performance of hazard control ventilation.³ Additionally, ventilation system owners can request a performance test upon the unit’s installation, when there is a change in operation, or when there is a suspected air flow issue.

Labeling

The industrial hygiene program manager records the results of the ventilation tests by updating the sticker attached to the system, usually at the point of use.⁴ The information on the sticker includes the name of the tester, the test date, and the measured flow rate. The sticker also indicates the proper alignment of the sash or slide gate damper (as applicable) to ensure adequate airflow. The results of calibrations, tests, and certifications are recorded in a database maintained by the industrial hygiene program manager.⁵

1 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 5, “Industrial Hygiene”, http://www-group.slac.stanford.edu/esh/hazardous_substances/industrial_hygiene/policies.htm

2 “Ventilated Lab Hoods”, http://www-group.slac.stanford.edu/esh/groups/cgs/ih/vent_hoods.htm

3 Hazardous Materials: Fume Hood Velocity Survey Form (SLAC-I-730-0A09J-002), <http://www-group.slac.stanford.edu/esh/forms/>

4 Hazardous Materials: Fume Hood Survey Sticker (SLAC-I-730-0A09J-004), <http://www-group.slac.stanford.edu/esh/forms/>

5 Industrial Hygiene Document Database, <http://134.79.80.221:2004/>

Monitoring

Some ventilated laboratory hoods have electronic flow monitors that continuously indicate the velocity of air flowing into the hood.

Use

The following precautions should be taken to reduce exposures to airborne contaminants:

- Keep the hood sash or slide gate damper (as applicable) set at the approved level or set point to provide proper air flow.
- Take care in placing equipment in chemical hoods; avoid restricting air flow or creating a fire hazard.
- Confirm the system is operational before using.
- Do not allow large equipment to be placed in front of ventilation hoods or system intakes as this could restrict air flow and reduce ventilation efficiency.
- Ensure the ventilation system is rated for the maximum hazard level of the intended operation.

Performance Standards

Laboratory fume hoods and local exhaust ventilation systems are addressed generally in standards, which incorporate references that provide specific design criteria and techniques to verify the system is in working order. The industrial hygiene program manager evaluates hazard control ventilation systems for the control of occupational hazards using the current edition of the American Conference of Governmental Industrial Hygienists, *Industrial Ventilation: A Manual of Recommended Practice*.⁶ See examples of hood face velocity sheet⁷ and fume hood survey stickers.⁸

Upon testing, if a ventilation system fails to meet the minimum performance standard, the industrial hygiene program manager will send a report to the system's custodian. It is the responsibility of the custodian to ensure that the deficient ventilation system is repaired and is not used until that time. Until the deficiency is corrected, the custodian will mark the system with a warning sign and effectively restrict activities as needed to prevent personnel over-exposure to contaminants.

New local exhaust ventilation systems and hoods must meet the requirements of building and fire codes and industry standards, and each hood must have a monitor that quantitatively displays the hood's performance to the user.

6 American Conference of Governmental Industrial Hygienists, *Industrial Ventilation: A Manual of Recommended Practice* (ACGIH 2094, 2004). See the SLAC Library, <http://www.slac.stanford.edu/library/>, for available standards. A hard copy is in process; see <http://www.slac.stanford.edu/spires/find/books/www?key=329274>.

7 Hazardous Materials: Fume Hood Velocity Survey Form (SLAC-I-730-0A09J-002), <http://www-group.slac.stanford.edu/esh/forms/>

8 Hazardous Materials: Fume Hood Survey Sticker (SLAC-I-730-0A09J-004), <http://www-group.slac.stanford.edu/esh/forms/>

HEPA Filters

High efficiency particulate air (HEPA) filters may be used to filter hazardous chemical or biological contaminants from air streams with an efficiency of 99.97 percent. HEPA filters used for hazard control can be found in vacuum cleaners used to clean up dust and debris that contain asbestos, lead, or other particulates, biological safety cabinets in which biohazardous materials are handled, and in-place ventilation exhaust systems connected to lab hoods and glove boxes.

HEPA filters used to protect employees must be maintained according to manufacturers' specifications. Using air sampling or direct ventilation measurement techniques, the industrial hygiene program manager evaluates processes where HEPA filters are used as part of hazard control ventilation. For information regarding the evaluation of HEPA filtering systems or changing HEPA filters used for hazard control, contact the industrial hygiene program manager.

Other Ventilation Equipment

The following ventilation systems are not covered by the industrial hygiene program:

1. Ventilation systems that provide fresh and recirculated air to office and other working spaces
2. Other ventilation systems that handle non-hazardous exhaust from general laboratories or shops, vacuum pump equipment, and mechanical rooms

These and similar systems are maintained and monitored by the Facilities Department.