1. Program Description

The Fume Hood Program provides a system for complying with the requirements of the applicable regulatory standards. The program defines the procedures for:

- Testing the face velocity/inward flow;
- Indicating the proper working sash height;
- Evaluating the various components of a fume hood;
- Reporting deficiencies and repair requests;
- Newly installed fume hood, as part of new construction or renovation;
- UCI fume hood user training in General hood purpose airflow characteristics, Potential for turbulent airflow and escape of hazardous substances from the hood Safe use of the hood and its features Performance testing Quantitative airflow monitor or alarm system Energy Conservation

Fume hoods affected by the Cal OSHA Variance, OSHSB File No. 11-V-030

2. Scope

When laboratory fume hoods are used to prevent harmful exposure to hazardous substances, such hoods shall conform to all applicable provisions the Cal-OSHA Title 8, Section 5154.1 and other applicable provisions in the UCI Fume Hood Testing Program. Biological Safety Cabinets are not covered by this program.

3. Definitions

Laboratory-Type Hood: A device enclosed except for necessary exhaust purposes on three sides and top and bottom, designed to draw air inward by means of mechanical ventilation, operated with insertion of only the hands and arms of the user, and used to control exposure to hazardous substances.

4. Responsibilities

UCI/EH&S:

UCI, through the administration of the EH&S office, shall be responsible for the establishment, implementation, and maintenance of a written fume hood program. The EH&S office shall:

- facilitate and coordinate testing of fume hoods;
- report deficiencies found during the EH&S-facilitated survey and produce repair requests;
- develop and provide training for the fume hood users;
- review fume hood commissioning reports.

The program shall be updated as necessary to reflect changes in workplace conditions that affect fume hood use.

Manager/Supervisor:

The UCI department manager/supervisor/PI/administrator shall be responsible for ensuring the proper use of the fume hood, following the Chemical Hygiene Plan, observing laboratory safe practices, and implementing worksite-specific procedures. These measures are intended to minimize, reduce, or eliminate UCI personnel exposures and may include administrative controls, or the use of personal protective equipment. EH&S shall work collaboratively with the affected UCI department to develop worksite-specific procedures. The affected department shall be responsible for implementing and maintaining the worksite-specific procedures.

Employee/Fume Hood User:

UCI personnel shall be responsible for:

- using the fume hood correctly;
- following the Chemical Hygiene Plan, laboratory safe practices, and worksite-specific procedures;
- reporting any fume hood in need of repair found during daily use.

5. Program Components

Fume Hood Testing Protocol:

Fume hood testing shall be performed annually. The face velocity shall be measured with the sash placed at the designated, proper working height (typically no higher than 18 inches or less as indicated by a sash stop and/or an affixed sticker that indicates the proper working height) using a calibrated, NIST traceable hot wire anemometer. Smoke visualization test shall also be performed to evaluate containment capability and turbulence. The Qualitative Smoke Visualization Rating Chart (Appendix B). The fume hood shall be tested...
The "pass criteria" shall comply with 8 CCR 5154.1 (c)(1), and other applicable standards, as appropriate.

The following information shall also be collected and reported:

- fume hood make and model
- sash height as found
- is the light working
- is the sash stop present
- is the sash in working order/good condition/glass cracked
- is the airflow alarm present and functioning
- smoke test result
- cross draft testing result
- Principal Investigator and contact number

All tested fume hoods shall bear a “fume hood sticker” (Appendix A) that contains the following information:

- Proper working height
- Result of the qualitative smoke visualization test
- Face velocity (the text “FAIL” shall be written in this field if the tested fume hood does not meet the “pass criteria”)
- Inspector
- Date of inspection
- Re-inspection date

Reporting Deficiencies and Repair Requests:

Fume hoods that do not meet the "pass criteria" are marked “FAIL” and are addressed immediately through issuance of a work order to Facilities Management. The fume hood shall not be used until deficiencies are corrected.

Newly Installed Fume Hood (New Construction or Renovation)- changes that may affect fume hood performance:

Commissioning testing is required for all newly installed fume hoods, as part of new construction or renovation, or when changes are made to the laboratory, its building, and/or the mechanical systems, or to the fume hood itself that may impact the fume hood’s performance. The testing shall include elements specified in the Fume Hood Testing Protocol of this program, as well as tracer gas test pursuant to 8 CCR 5154.1 (c)(2)(B).

Cal OSHA granted variance for use of “low flow, high efficiency” fume hoods at UCI. The variance document, OSHSB File No. 11-V-030, is in Appendix D of this program. All fume hoods affected by the variance are subject to and shall follow the document’s compliance elements.

6. Reporting Requirements

- Fume hood testing requests are made by contacting the UCI EH&S Office.
- Fume hood repair requests are made by contacting the Facilities Management Service Desk.

7. Competency Assessment and Training Requirements

Fume Hood User Training:

All fume hood users shall receive training in the following elements:

- General hood purpose
- Primary engineering control method for potential exposures
- Containment method for unanticipated fires/explosions/splashes
- Fume hood components
- Airflow characteristics
  - Once-through system
  - Capture efficiency and optimum velocity
- Potential for turbulent airflow and escape of hazardous substances from the hood
  - Impact of high face velocity/low face velocity
  - Impact of blocking baffles
- Safe use of the hood and its features
  - Types of fume hoods
  - Work practices/correct use
    - “Do not operate fume hoods marked ‘FAIL’ until repaired”
- Performance testing
  - EH&S procedures (survey, tags, yellow sticker, repair requests)
  - Other performance tests
- Quantitative airflow monitor or alarm system
  - Location on the hood
  - Use as flow indicator
- Energy Conservation
  - Anecdotal statistical data
  - Keep sash closed when not in use

User competency is assessed during the online training or instructor-led training.

8. Information and External References

Appendix A - Fume Hood Sticker
Appendix B - Qualitative Smoke Visualization Rating Chart
Appendix C - Fume Hood Commissioning and Performance Testing
Appendix D - Cal OSHA Variance Addressing “Low Flow” Fume Hoods

Title 8 California Code of Regulations  Section 5154.1. "Ventilation Requirements for Laboratory-Type Hood Operations."
Operations.

ANSI Z9.5- 2003 Laboratory Ventilation

University of California ENVIRONMENT, HEALTH & SAFETY (EH&S) LABORATORY SAFETY DESIGN

University of California, Irvine Chemical Hygiene Plan