Laboratory Ventilation Management Program Appendix 10.2.2

Stanford University Gas Cabinet Performance and Testing Requirements

The following describes Stanford's expectations for performance, testing, and certification of gas cabinets (GC), also known as toxic gas cabinets. All vendors must ensure their procedure meets these expectations. If a separate procedure is developed to meet Stanford's requirements, technicians assigned to Stanford must be trained on the new procedure and note its use in the report.

I. Standards

Stanford expects all testing and certification operations to meet the requirements of the following regulations and standards:

- California Fire Code-2016; Ch. 60, Section 6004.1.2 and Ch. 50, Section 5003.8.6
- Santa Clara County Code of Ordinances, Title B, Division B11, Chapter XIV, Sec. B11-384
- Cal/OSHA 8 CCR 5143(a)(5)

II. Certification Test Requirements

Prior to beginning tests we expect the technician to inspect the following:

1. Ensure cabinet in good condition, all panels in place, no corrosion of panels/work surface, door is self-closing.
    a. If there is damage to the cabinet do not proceed with the tests and report to client.

III. Performance Criteria

A. The average ventilation velocity at the ports or windows shall be not less than 200 feet per minute (fpm) with a minimum of no less than 150 fpm at any point of the port or access window.

IV. Frequency of Certification

Gas cabinets are required to be certified:

- annually, at a minimum (per 8 CCR 5143)
- whenever a gas cabinet has been modified
- whenever the exhaust duct system connected to a cabinet has been modified.
- whenever use is resumed after hibernation (i.e., un-hibernation)

V. Equipment / Materials Required for Certification

- Thermal anemometer (calibrated as specified by manufacturer)
- Pitot tube
- Titanium tetrachloride, dry ice in water, or other means of visualizing airflow
- Tape measure
- Documentation form

VI. Certification Procedure

A. Total Exhaust Air

Perform an average duct reading. Measure and record the duct diameter and calculate the total exhaust volume (Q = VA).

B. Quantitative - Port or window face velocity test

1. Set up a 3x3 grid to take 9 readings.
2. Calculate and record the average face velocity.
3. If the unit has >200 fpm average face velocity and no point <150 fpm, the unit has PASSED. If average face velocity <200 fpm OR any point < 150 fpm, then the unit has FAILED.

C. Qualitative - smoke capture test

1. With the port or window open, generate smoke perpendicular to the direction of air flow around the open face.
2. If the smoke is fully captured, the unit has PASSED. If smoke is poorly captured, FAIL the unit.

D. For units that PASS both the Quantitative face velocity test and Qualitative smoke capture test:

1) Document that unit has passed performance inspection on the Survey Form and affix a certification sticker. The unit is certified for use to prevent harmful exposures to hazardous substances.

E) For units that FAIL, immediately:

1) Inform users, FacOps Zone Manager or Engineering & Maintenance, and building manager that the unit has FAILED performance inspection and CANNOT be used for containment of hazardous materials until the unit has been certified.
2) Document that the unit has failed performance inspection on the Survey Form.
3) Affix signage to cabinet stating that it CANNOT be used for preventing harmful exposures to hazardous chemicals.
4) Repeat performance evaluation after necessary corrections have been made.

F) Data Management

1) Provide the gas cabinet certification form to the client.
2) As feasible, provide a database or spreadsheet of all gas cabinets tested, including the location (building and room), type of unit (e.g., gas cabinet), date of test, and due date of re-test.