

**TEXAS AGRILIFE  
RESEARCH/TEXAS  
AGRILIFE EXTENSION  
SERVICE**

**CHEMICAL FUME  
HOOD PERFORMANCE  
TESTING AND  
CERTIFICATION  
STANDARD OPERATING  
PROCEDURE (SOP)**

## **Purpose:**

To establish a Standard Operating Procedure (SOP) for chemical fume hood performance testing and certification and to promote safe chemical handling practices and the safety of Texas AgriLife Research and Texas AgriLife Extension Service employees while utilizing a chemical fume hood.

## **Scope:**

This SOP applies to chemical fume hoods at Texas AgriLife Research and Extension Service Centers and other Texas AgriLife Research and Extension Service designated facilities. This SOP is not applicable to biological safety cabinets (BSCs).

## **Procedures:**

### **FUME HOOD PERFORMANCE TESTING:**

Chemical fume hood performance tests shall be conducted at least annually on all chemical fume hoods. Fume hood performance testing includes an air flow face velocity test followed by containment verification through flow visualization. All testing procedures herein conform to the ANSI Z9.5 (2003) and ASHRAE 110 (1995) Standards. Proper methods for measuring face velocity and verifying containment are described below.

### **AIR FLOW FACE VELOCITY TESTING:**

Hood face velocity is defined as air speed in a direction normal to the plane of the hood face opening. The average face velocity of a hood shall provide adequate capture and containment of gases, chemical vapors and aerosols under “As Used” conditions.

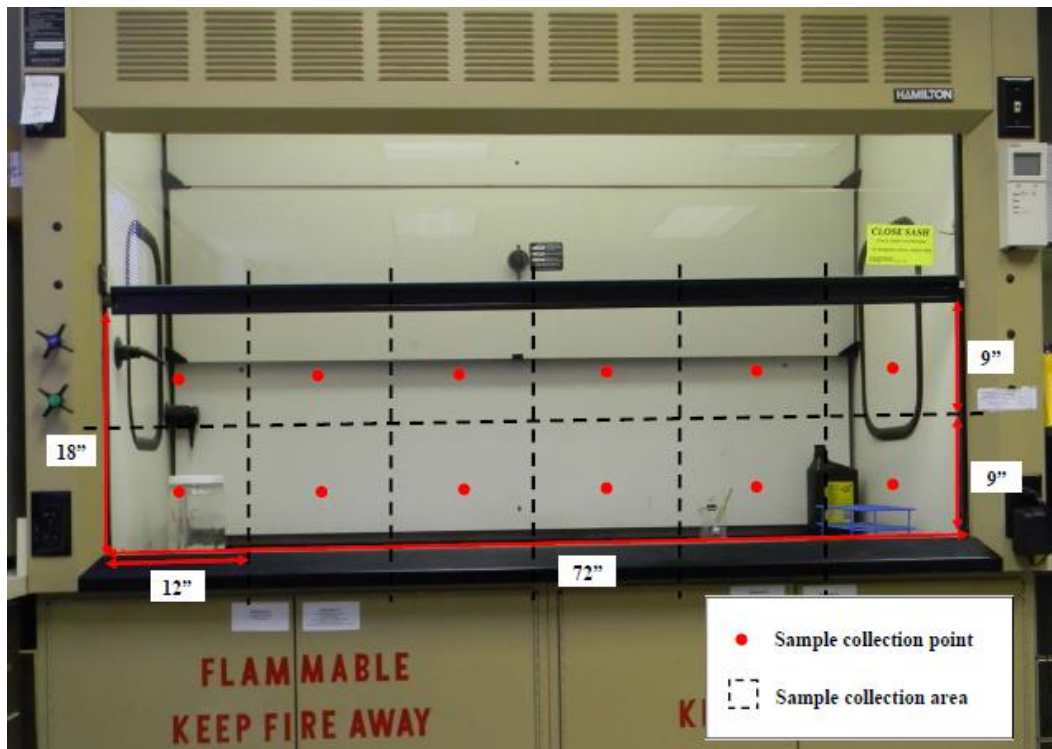
### **Equipment/materials needed:**

1. TSI Air Velocity Meter (model 9545 or 9555)
2. Measuring tape

### **Testing Procedure:**

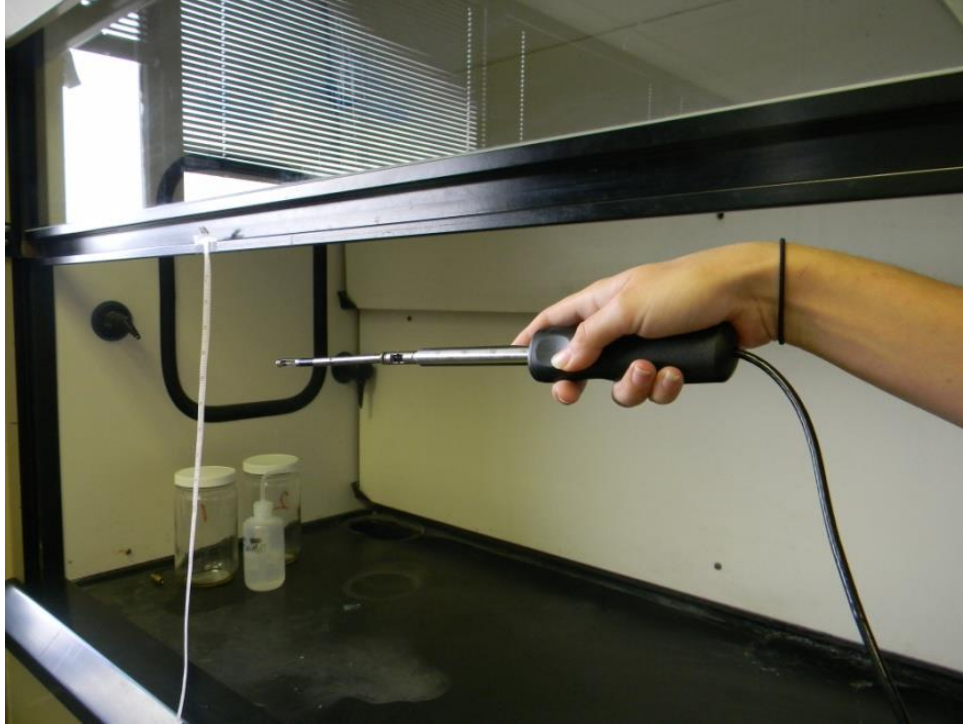
1. Turn on hood exhaust and position sash so that the fume hood opening is 18 inches.

2. Determine hood face opening area in inches (measure X and Y axis; Y axis should equal 18", X axis will vary depending on hood size).
3. Divide hood face opening area into a grid pattern of equal area, 12" X 9" sample collection areas. For example, on a 6 foot (72") chemical fume hood with a sash height of 18", you would have two rows of 6 for a total of 12 sample collection areas.



4. Turn on TSI Air Velocity Meter (Model 9545 or 9555) and verify meter settings are correct. (Follow instructions provided in the TSI Air Velocity Meter Quick Reference and Operation Guide).
5. Measure face velocity for each defined sample collection area (one sample per grid area). To do this, hold TSI Air Velocity Meter probe in the center of each grid area (square), directly in line with the sash, with the probe tip opening normal to the plane. Be sure to stand to the side during measurement to minimize affects to air flow. (Follow instructions provided in the TSI Air Velocity

Meter Quick Reference and Operation Guide to collect sample velocity measurement).



6. Repeat steps 1-5 for each air flow face velocity test.

## CONTAINMENT VERIFICATION/FLOW VISUALIZATION:

This test provides an observation of performance through the visualization of a fume hood's ability to contain vapors.

Equipment/materials needed:

1. Ventilation smoke tube(s) or equivalent



Testing Procedure:

1. Turn on hood exhaust and position sash to fully open.
2. Continuously discharge smoke from ventilation smoke tube on the exterior along top, bottom and sides of the hood face opening.



3. Continuously discharge smoke under the bottom air foil.



4. Discharge smoke at the top of the hood (6 in. behind the face of the hood) and along all equipment within the hood.



5. Observe and note airflow patterns seen and time of test; if smoke visibly flows out of the front of the fume hood, the fume hood has failed the test.
6. Repeat steps 1-5 for each flow visualization test.

## **CERTIFICATION OF CHEMICAL FUME HOOD:**

The following conditions must be met for a chemical fume hood to be certified for continued use:

1. The average face velocity of the fume hood with the sash positioned at 18" must be within the range of 80 to 120 ft/min. If the hood exceeds the range with the sash at 18", the velocity must be tested with the sash at full-open position.

AND

2. The fume hood must pass the flow visualization test. (i.e. no smoke can visibly flow out of the front of the hood)

If the fume hood does not meet the requirements above, the fume hood shall be taken out of commission until repairs can be made and the hood can meet certification requirements. A clearly visible "NOT SAFE FOR USE" sign must be posted directly on the fume hood. In addition, if the sash glass is broken or resistance in movement of the sash is observed, the fume hood cannot be certified for use.

If the above conditions have been met, document average face velocity, date of inspection, and initials of person inspecting and display on fume hood. (See below for example of documentation)



**RECORDS MAINTAINENCE:**

Maintain records of annual performance testing (both Face velocity and flow visualization) for life of the chemical fume hood plus three years (per TAMU System Record Retention Regulation 61.99.01).