

## LABORATORY FUME HOODS

### DESIGN & INSTALLATION

#### 1. Design Requirements

- a. Existing Laboratory Fume Hoods shall be ASHRAE 110 certified by a third party if they are being re-used during the design phase. This work needs to be coordinated with the WUSM project manager.
- b. Laboratory Fume Hood airflows (for new installations and for renovation projects) shall be designed and/or specified to meet the below performance requirements.
- c. Laboratory fume hoods that are ducted to variable volume exhaust air systems shall be provided with a pressure independent automatic flow control device (specified on mechanical drawings). See section "Air Valves" for application requirements.
- d. Utility service valves shall be on the outside of the hood. This allows for replacement of the valves from the exterior of the hood.
- e. Hoods shall have an access panel in the front top of the hood.
- f. Lights in hood to be accessible for replacement from the access panel at the top front of the hood.
- g. Hood to have digital readout with velocity at fume hood.
- h. Acid storage cabinets to be vented into fume hood.
- i. Under hood flammable storage cabinets may require venting, see below.
- j. Hoods to include LED lighting with color (Kelvin) verified per project.
- k. Fume hood monitor that is R-Y-G.
- l. VAV hoods and motorized sashes to be discussed on a project basis. VAV hoods to include sash sensors. VAV hoods to include occupancy sensors at hoods for automatic operation into occupied mode.
- m. Utilize building control system where possible for control of air valves and VAV terminal units.
- n. The use of air valves at the fume hoods shall be discussed and determined on a project basis, see standard section, "Air Valves".

#### 2. Performance Requirements

- a. Containment: Provide fume hoods that comply with the following when tested according to ASHRAE 110 as modified below at a release rate of 4.0 L/min.:
  - Average Face Velocity: Low flow hood - 60-80 fpm with sash 14" high
  - Average Face Velocity: Standard flow hood - 80-120 with sash 14" high
  - Hood control valve to be sized for full open sash at 55 fpm.
  - Face Velocity Variation: Not more than 10% of average face velocity.
  - Sash Position:

1. Test hoods with combination sashes with maximum opening on one side, with maximum opening in the center, and with one opening at each side equal to half of maximum opening.
  2. Test hoods with combination sashes raised to 14" with horizontal windows closed.
  3. As-Manufactured (AM) Rating: AM 0.05 (0.05 ppm).
  4. As-Installed (AI) Rating: AI 0.05 (0.05 ppm).
- b. Test Setup Modifications: Conduct tests with a minimum of 3 and a maximum of 5 people in the test room and with two 1-gal. round paint cans, one 12-by-12-by-12-inch cardboard box, and three 6-by-6-by-12-inch cardboard boxes in the fume hood during the test. Position items from 6 to 10 inches behind the sash, randomly distributed, and supported off the work surface by 2-by-2-inch blocks.
- c. Walk-by Test: At the conclusion of containment test, execute 3 rapid walk-by's at 30-second intervals, 12 inches behind the manikin. Test-gas concentration during each walk-by shall not exceed 0.1 ppm and shall return to specified containment value within 15 seconds.
- d. Include fume hood ASHRAE 110 certification by:
- ACE in bid documents or
  - A qualitative and quantitative report that meets the National Environmental Balancing Bureau (NEBB) criteria shall be certified and submitted by a NEBB Certified Fume Hood Testing (FTH) Professional. The certification page shall bear the stamp of the NEBB Certified FHT Professional. The stamp on the certification page shall be signed as evidence that the NEBB Certified FHT Professional has personally reviewed and accepted the report. Signature stamps are prohibited.

#### EQUIPMENT and PRODUCT REQUIREMENTS

See Division 11 – Equipment

END OF SECTION