

**FUME HOOD SPECIFICATION
SECTION 11610.5
PRO ADA/HOPEC FUME HOODS**

**Mott Manufacturing Limited
Brantford, Ontario, Canada**

SECTION 11610.5 – PRO ADA FUME HOODS

1.5. DESIGN

- 1.5.1. Fume hoods shall be designed and constructed in accordance with SEFA 1.2-1996 - Laboratory Fume Hoods.
- 1.5.2. Hoods shall function as ventilated, enclosed work spaces, designed to capture, confine and exhaust fumes, vapours and particulate matter produced or generated within the enclosure.
- 1.5.3. Fume hoods shall provide safe operation when properly installed and connected to an exhaust system, and shall provide proper evacuation of air volume to permit the fume hoods to operate at specified face velocity. Design hoods for consistent and safe air flow through face of hood with negative variations of face velocity exceeding 20% of average face velocity at any designated measuring point as defined in this Section.
- 1.5.4. The design of the fume hood enclosure shall be an aerodynamically efficient fume exhaust system, minimizing turbulence within the chamber and the volumes being exhausted from the laboratory.

1.6 Performance Requirements:

- 1.6.1. Fume Hoods, Sigma Systems “HOPEC TYPE” model, shall be designed to meet or exceed the American Standard for Laboratory Ventilation and the American Industrial Hygiene Association standard as described in ANSI/AIHA Z9.5-1992. This standard of performance has been verified through testing at an independent and certified testing facility which has conducted the tests in accordance with the established protocol as set out by the ANSI/ASHRAE 110-1995 standard.
- 1.6.2. Test Results Summary: The test results confirm that the face velocity has a maximum deviation of +/- 20% of the individual velocity when the mean face velocity is 100 fpm per square foot of sash opening.
- 1.6.3. The static containment shall better the 4.0AM0.01 (ANSI/ASHRAE 110-1995) standard.
- 2.2.1. Manufacturer shall provide copies of test results upon request.

1.7. Factory Fume Hood Test Facility:

- 1.7.1. Manufacturer of fume hoods shall have the capability within his own plant facility of performing fume hood tests based on the latest ANSI/ASHRAE Specification 110-1995.

PART 2: PRODUCTS

2.1. GENERAL: LABORATORY FUME HOODS

- 2.1.1. **Basic Materials:** In accordance with requirements of Section 11601, Art. 2.1.

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2.1.2. **Fume Hood Materials:**

- 2.1.2.1. Exterior Panels, Framing Members, and Furring Panels: Cold rolled and levelled mild steel and shall conform to ASTM A366, finished as in Para. 2.3.
- 2.1.2.2. Screws: Interior fastening devices; truss head stainless steel screws protected with plastic “snap-on” caps.
- 2.1.2.3. Upper front panel to be 18 Ga thick mild steel, with out By-Pass Grilles, finished same as exterior panels.
- 2.1.2.4. Lower Foil: To be Type 316 stainless steel mounted behind the sash and sitting in a 2” deep trough flush with the counter top. For ease of cleaning, assembly shall swing up.
- 2.1.2.5. Safety Glass: Laminated type 6 mm thick as per Section 11601.
- 2.1.2.6. Sash guides on track shall be corrosion resistant black polyvinyl chloride (PVC).
- 2.1.2.7. Sash Cables: 3/32” stranded stainless steel.
- 2.1.2.8. Sash Pull: To be full width, Type 316, 18 Ga thick stainless steel with an AISI #4 satin finish.
- 2.1.2.9. Pulley Assembly For Sash Cable: 1-1/2” diameter nylon rim , ball bearing roller, with cable retaining device.
- 2.1.2.10. Provide interior access panels on both sides, and secure using special moulded vinyl gasket designed to be removed and reinstalled without use of special tools.
- 2.1.2.11. Baffle Support and Control Brackets: Type 316, 16 Ga stainless steel.
- 2.1.2.12. Duct Stubs: Bell shaped Type 316, 18 Ga stainless steel.

2.1.3. **Hood Linings:**

- 2.1.3.1. Poly resin type: Hood linings and baffles shall be fibreglass reinforced polyester thermoset resin of 3/16” thickness. The fibreglass reinforced polyester panel shall have a minimum flexural strength of 15,000 psi, with a flame spread of 25 or less as per ASTM #E84. Final appearance shall be smooth and white in colour..

2.1.4. **Fume Hood Furring Panels:**

- 2.1.4.1. Where called for, provide matching furring panels to enclose the space between top edge of fume hoods and the finished ceiling.
 - 2.1.4.2. Panels shall be flanged, notched and reinforced where required to form a well-fitted enclosure, free from oil canning. Secure panels using cadmium-plated, self-tapping screws; panels shall be removable for maintenance purposes.
 - 2.1.4.3. Finish shall match fume hood to which it is connected.
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2.2 SIGMA “HOPEC TYPE” FUME HOOD

2.2.1. Construction:

2.2.1.1. Fume hood superstructure shall be double wall construction consisting of an outer shell of sheet steel and an inner hood liner. Double wall shall house and conceal steel framing members, attaching brackets and remote operating service fixture mechanisms. Overall double wall thickness: 4-3/4” maximum.

2.2.1.2. Front double-wall posts shall be pre-punched to accept up to 5 plumbing fittings per side, two electrical duplex outlets, light switch and optional monitor alarm where indicated on drawings. Electrical outlets and light switch shall be factory-wired and terminate at a junction box on roof of hood. All electrical devices shall be UL and/or CSA certified.

2.2.1.3. Exterior panel members shall be fastened by means of concealed devices. Exposed screws are not acceptable.

2.2.1.4. Provide access to remote-controlled fixture valves concealed between walls through removable panels on hood exterior and access panels on both inside liner walls. Assemble hood superstructure, fasten and connect inner and outer frame into a rigid self supporting entity.

2.2.1.5. Install fluorescent lighting fixture on exterior of roof. Provide a 6 mm safety glass panel on hood "roof", sealed to isolate the lighting fixture from fume chamber. The 2-lamp fixture in each hood shall be largest possible for fume hood size, and shall be rapid start type, UL and/or CSA certified. Provide lamps to fixtures. Average interior illumination levels within the fume chamber shall be 80 foot candles minimum. Ballast shall be sound rated to limit noise level. Finish fixture interior with white, high reflecting baked enamel.

2.2.1.6. Work areas shall be defined as that area inside the superstructure from side to side and from face of baffle to the inside face of sash and from the work surface to a height of 28”.

2.2.1.7. Fume hood sash shall be full view combination vertical raising, and horizontal sliding type providing a clear and unobstructed side to side view of fume hood interior. Horizontal sash shall be laminated safety glass not greater than 18” wide set into extruded aluminum shoes with PVC gaskets. Each shoe shall ride on 2 nylon rollers locked in the vertical sash to avoid inadvertent removal. Vertical edges of sash glass panels to have a clear plastic edge guard. Vertical sash shall raise in a flush PVC track. Bottom, top and side sash rails shall be 18 Ga stainless steel welded to form an integral structure. Bottom rail shall be an integral, formed, full width, flush pull and shall be anchored on each side to sash cables at bottom. A single weight, pulley, cable, counter balance system shall be used for vertical operation of sash and prevent jamming to permit one finger operation at any point along full width sash pull and to maintain sash at any position without creep. Sash system shall be designed to prevent sash drop in the event of cable failure. Superstructure shall have a single sash and counter balance system. Sash shall open and close against rubber bumper stops.

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- ~~2.2.1.8. Hood sash shall raise vertically into an enclosure box to assure a leak free chamber.~~
- 2.2.1.9. Hood shall be variable volume type without a built in automatic compensating by-pass.
- 2.2.1.10. Perimeter of sash opening shall have a streamlined shape side and top with angled opening toward hood interior. Air shall enter under the bottom horizontal foil through a nominal 1" by-pass when the sash is in the closed position. Bottom foil shall be removable without the use of special tools. Sash shall close in front of airfoil.
- 2.2.1.11. Three-piece main baffles shall provide controlled air vectors into and through the fume hood and be fabricated of the same material as the liner. Provide exhaust slots on the full perimeter of baffles, with adjustable valves for top and both sides of baffles. A fixed, permanently-open, horizontal slot located at 31-1/2" above the work surface shall be provided at the overlapping mid-point of the main baffles.
- 2.2.1.12. Manual Control Baffle System
Baffle positions should only be set by qualified personal experienced with fume hood balancing.
- 2.2.1.13. For safety, fume hood shall maintain essentially constant exhaust volume at any baffle position. Changes in average face velocity and exhaust volume as a result of baffle adjustment shall not exceed 5% for any baffle position at the specified face velocity.
- 2.2.1.14. Design fume hoods to minimize static pressure loss with adequate slot area around the baffle and the bell shaped exhaust collar configuration. Measured average static pressure loss reading taken three diameters above the hood outlet from four points, 90° apart, shall not exceed the following values based on 60" wide hood:
- | <u>Face Velocity</u> | <u>Measured Static Pressure Loss</u> |
|----------------------|--------------------------------------|
| 75 F.P.M. | 0.20" |
| 100 F.P.M. | 0.25" |
- 2.2.2. Electrical convenience duplex outlets shown mounted on the face of fume hoods shall be installed in front posts and pre-wired to a junction box mounted on top of fume hood superstructure. Electrical devices shall be CSA and UL approved manufacture.
- 2.2.3. Sash height shall be limited to have two sets of integral sash height limiting hardware mounted on the exterior of the hood which prevents raising the vertical sash above certain points unless manually defeated by the operator. Set points shall be closed and at 15" above counter top.
- 2.2.4. Bottom slot covered with stainless steel screen. Screen to be mounted horizontally behind baffle as low as possible. Screen to be 3/4" x 3/4" 18 ga diamond pattern.

2.2.5. The minimum sash height shall be 36” with a 6” clear static panel mounted at the top of the sash frame to maintain a minimum sash open of 30”.

2.2.6. Interior clear dimension front to back shall be 30”

2.3. FUME HOOD EXTERIOR FINISH

2.3.1. Steel finish shall be as described in Appendix 1.

2.4. AIR FLOW MONITOR/ALARM

2.4.1. Customer to specify make and model of Alarm

PART 3: EXECUTION

3.1 INSTALLATION

3.1.1. In addition to requirements of Section 11601, install fume hoods in positions shown, align and set level with levelling devices.

3.1.2. Work in close cooperation with allied trades installing ductwork, wiring and other services.

3.1.3. Apply small bead of sealant to junction of fume hood counter top and adjacent hood liner.

3.1.4. Turn over to Mechanical Trades, service fitting remote control rods and valves for installation to fume hood superstructure and service lines.

END OF SECTION

