

## LABORATORY FUME HOODS

### 1.01 SUMMARY

A. Section Includes: Fume hoods

B. Related Sections

1. Division 12 Section - 123553 - Steel Laboratory Casework
2. Division 12 Section - 123553 - Adaptable Furniture Systems
3. Division 15 - Plumbing utilities final connections to casework and fume hoods.
4. Division 15 - Mechanical, HVAC ductwork, equipment, final connections to fume hoods.
5. Division 16 - Electrical utilities and final connections to casework and fume hoods.

### 1.02 FUME HOODS

- A. Fume hood superstructures shall be of double wall construction, with the exterior shell fabricated of 18 gauge, high quality, mild cold rolled steel and the inner wall liner fabricated of 1/4" thick non asbestos corrosion resistant Glastic Liner Board. Interior to be metal free with bright white interior liners. Liner to provide superior resistance to chemicals and high temperatures. Other Fume Hood Liners are available when specified.
- B. The exterior shell with its attached liner shall be rigid and self-supporting without reliance on the outer wall for support and stability. Access to fixture valves contained between the exterior and interior walls shall be through removable panels on the interior liner wall. Exterior access panels on both sides should provide easy access for maintenance and for adding additional service fixtures in the future. Interior access panels to have PVC soft gaskets on both sides to eliminate seepage into sidewalls. Interior and exterior panels are attached to a full perimeter epoxy coated steel frame for strength and durability.
- C. Screws and other fastening devices shall not be visible nor exposed, with the superstructure flush and smooth. The exterior shell finished with baked-on, chemically resistant finish to match the other metal furniture in the laboratory.
- D. The Fume Hood shall be provided with vertically operated counter-balanced sash, with the sash fabricated from 1/4" ANSI II automotive safety glass, laminated safety glass,

## Fume Hood Specifications

- 36" high safety glass, shall provide an optimal unobstructed sight line into the fume hood. 30" full vertical sash opening for easier set up of lab processes and apparatus. The counter-balance shall hold the sash at any position in its travel, without creep. The sash shall move forward without binding, and shall be easily operable at any point along its full width. Horizontal, Combination, Double Sided, and Split sash designs are available when specified.
- E. Bottom air foil to be stainless steel. A stainless steel vented finger pull attached to the bottom sash allowing smooth air passing through the work surface. Air Foil to be flush sill design with smooth air passing along work surface.
  - F. Light fixtures shall be mounted on the exterior roof of the Fume Hood. Light fixtures shall be LED type. LED lighting is located away from fumes and gives for superior interior illumination. Provided two fixtures on 8'-0" Fume Hoods or longer. Explosion proof and incandescent fixtures available when specified.
  - G. Interior baffles shall be fabricated from the same material as the interior liner. Provide single point fixed baffle for optimum air flow. Fixed baffles available when specified.
  - H. Fume Hood shall be provided with 4" x 24" rectangular exhaust duct collar(s), fabricated from type 304 stainless steel for superior corrosion resistance. Provide a 4" x 36" exhaust collar on 94" fume hoods. Provide two (2) 4" x 24" exhaust collars on 120" fume hoods.
  - I. The Fume Hoods shall be equipped with automatic air by-pass which is not dependent upon mechanical or electrical linkage, and which allows a relatively constant velocity of air passing through the face with the sash at any position.
  - J. The Fume Hoods shall be provided with a low flow alarm (optional) which provides audible and visual indications when the face velocity has dropped below a predetermined setting, when specified.
  - K. Service fixtures mounted inside of the Fume Hoods shall consist of valves controlled from the exterior of the Fume Hood. Fixture components exposed on the interior of the Fume Hood shall be Water Saver Brand Color Tech epoxy coated and color coded to the type of service provided. Service fixture holes shall be provided with caps for adding service fixtures in the future.

- L. Electrical components provided shall be UL approved and labeled. Provided as standard, two (2) electrical 120V, duplex receptacles, one (1) light switch, each mounted to the outside of the fume hood front posts and LED light. Electrical plates shall be stainless steel. Electrical fixtures shall be field wired by others. Pre-wiring (optional) of Fume Hoods: Electrical fixtures and lights to be internally wired at the factory to a junction box at the top of the hood. Hood shall have 2 junction boxes, one located at the far left and far right sides of the hood. Electrical connections from either junction box shall provide power to all devices on hood. Hood shall be pre-wired to easily convert to 2 circuit electrical system if desired. One junction box to include a 120V duplex receptacle.
- M. Fume hoods to be provided with concealed wire management chase systems. The wire management system to be built into the hoods at the left and right side locations to run cords or tubing onto the hoods. Systems utilizing cords or tubing running under the sash are unacceptable. Chase to be constructed of leak-proof, flexible tubing providing electrical wire protection during routing applications.

### 1.03 FUME HOOD TYPES

1. Conventional By-Pass Fume Hoods provides a relatively constant volume of air to move through the Fume Hood, to ensure operator safety, regardless of the position of the sash.

This is achieved through the combination of the by-pass grill, located in the Fume Hood face panel, openings at the top of the Fume hoods and under the counter airfoil and the sash opening itself. The air being exhausted through the Fume Hood comes from within the room. The room should be balanced to compensate for the volume of air exhausted.

2. Restricted By-Pass Fume Hoods shall be sufficient in size to allow 25% flow with sash closed. By-pass must be achieved through grill or louvers on face lintel panel.
3. Hanson Lab Solutions 5SA Series Bench Top Fume Hoods include:  
General Purpose, Hi-Line, ADA models.  
Conventional By-Pass or Restricted By-Pass.  
Widths: [48"] [60"] [72"] [96"] [120"] [144"]

## Fume Hood Specifications

Depths: A depth - 31-3/8", B depth - 37-3/8", C depth - 41-3/8".

4. Hanson Lab Solutions 4SA Series Walk-In Style Fume Hoods include:  
Conventional By-Pass or Restricted By-Pass

Widths: [48"] [60"] [72"] [96"] [120"] [144"]

Depths: A depth - 36", B depth - 47-3/8"

#### 1.04 QUALITY ASSURANCE

- A. Single source responsibility: Fume hoods, casework, work surfaces, and other equipment and accessories shall be manufactured or furnished by a single furniture company.
- B. Manufacturer's qualifications: Modern plant with proper tools, dies, fixtures and skilled employees to produce high quality casework and equipment, and shall meet the following minimum requirements.
1. Five years or more experience in manufacture of casework and equipment of type specified.
  2. Ten installations of equal or larger size and requirements conforming to ASTM Specifications No. A36672.
- C. Stainless steel: Type 304 or 316 gauges; conforming to ASTM Specification No. A240
- D. Safety Glass: 1/4" thick laminated type ANSI II rated automotive safety glass.
- E. Lining: 3/16" thick bright white Glastic liner board 1/4" thick with smooth surface for easy cleaning and superior resistance to chemicals and high temperatures.
- F. Sash Cables: Aircraft type, stainless steel.  
Sash cable pulleys shall be 2.5" diameter roller bearing type for ease of sash travel with cable retainer to secure cables on pulley system.
- G. Sash Guides: Ultra high molecular polyethylene strips mounted on sash frame, stainless steel channel mounted on Fume hood body.



## Fume Hood Specifications

- H. Sash Pulley: Nylon tired ball bearing sheaves 2.5” diameter.
- I. Sash pull: Corrosion resistant stainless steel.
- J. By-Pass Grill: Punched louvered powder coated.
- K. Light Fixture: UL listed vapor proof LED.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURER**

Laboratory furniture and fume hood manufacturer:  
Hanson Lab Solutions, LLC  
747 Calle Plano  
Camarillo, CA 91320  
805-498-3121

### **2.02 FUME HOOD MATERIALS**

- A. Steel: High quality, cold rolled mild steel, free of scales, buckles or other defects, conforming to ASTM Specifications No. A36672.

### **2.03 FUME HOOD FINISH**

1. Pretreatment: Thoroughly clean surface of grease, dirt and oil in an alkaline solution, rinse, then immersed in a phosphatizing solution. Bake entire unit with metallic phosphate coating to provide excellent bond for subsequent finish and aid in prevention of corrosion.
2. Finish Coat: Apply one coat of environmentally non-hazardous thermosetting Epoxy Powder Coated finish. This material shall meet the most stringent air quality standards. The final finish shall meet the following test data with no more than slight discoloration but no change of gloss and no loss of adhesion with exposure to the following chemicals:

Acetate, Amyl  
Acetate, Ethyl  
Acetic Acid 98%  
Acetone  
Acid Dichromate 5%

## Fume Hood Specifications

Alcohol, Butyl  
Alcohol, Ethyl  
Alcohol, Methyl  
Ammonium Hydroxide 28%  
Benzene  
Carbon Tetrachloride  
Chloroform  
Chromic Acid 60%  
Cresol  
Dichloroacetic Acid  
Dimethylformamide  
Dioxane  
Ethyl Ether  
Formaldehyde 37%  
Formic Acid 90%  
Furfural  
Gasoline  
Hydrofluoric Acid 37%  
Hydrofluoric Acid 48%  
Hydrogen Peroxide 30%  
Iodine, Tincture of  
Methyl Ethyl Ketone  
Methylene Chloride  
Monochlorobenzene  
Naphthalene  
Nitric Acid 20%  
Nitric Acid 30%  
Nitric Acid 70%  
Phenol 90%  
Phosphoric Acid 85%  
Silver Nitrate, Saturated  
Sodium Hydroxide 10%  
Sodium Hydroxide 20%  
Sodium Hydroxide 40%  
Sodium Hydroxide, Flake  
Sodium Sulfide, Saturated  
Sulfuric Acid 33%  
Sulfuric Acid 77%  
Sulfuric Acid 96%  
Sulfuric Acid 77%, and Nitric Acid 70%, equal parts  
Toluene  
Trichloroethylene  
Xylene1  
Zinc Chloride, Saturated

3. Adhesion and flexibility: No peeling, cracking or exposure of metal when painted surface is bent 180 degrees over  $\frac{1}{4}$ " diameter mandrel.

## 2.04 PERFORMANCE REQUIREMENTS

1. The Fume Hoods, when properly installed in a laboratory and connected to an exhaust fan of the proper capacity, shall contain and remove fumes generated within the Fume Hood. The average face velocity range should be between 100 and 125 FPM. (Averages higher or lower are acceptable in some instances depending upon the materials being used).

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2. The Fume Hood shall operate at any setting within these ranges. The Fume Hood design shall be such that it will exhaust light or heavy gases efficiently, when the Fume Hood is used for ordinary laboratory work in a room free from cross drafts, and without high thermal loads of other special conditions. No reverse flows of air will be allowed along the sides, bottom or front of the Fume Hood.
3. Fume Hoods to be tested within their test facility to conform to American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE) Standard 110-1995 and is UL 1805 Classified. Bench top fume hoods shall meet (ASHRAE) Standard 110-1995 specification for 60 LFM at 18" sash opening for low airflow design. Performance test results for measurement of face velocities are available upon request. In addition, Hanson Lab Solutions LLC. Fume Hoods have been tested and approved by the City of Los Angeles.

**PART 3 – EXECUTION****3.01 INSTALLATION**

## A. Installation:

1. Install fume hoods and equipment in accordance with manufacturer's instructions.
2. Install equipment plumb, square, and straight with no distortion and securely anchored as required.
3. Secure work surfaces to casework and equipment components with material and procedures recommended by the manufacturer.

## B. Accessory installation: Install accessories and fittings in accordance with manufacturer's recommendations.

**3.02 ADJUSTING**

- A. Repair or replace defective work, as directed by Architect or Owner upon completion of installation.



## Fume Hood Specifications

- B. Adjust sash, fixtures, accessories and other moving or operating parts to function smoothly.

### **3.03 CLEANING**

Clean equipment, touch up as required.

### **3.04 PROTECTION OF FINISHED WORK**

- A. Provide all necessary protective measures to prevent exposure of equipment to other construction activity.
- B. To prevent hoods from damage by work of other trades, advise contractor of necessary precautions.

**END OF SECTION**