

Bedcolab Vanguard Laboratory Fume Hoods

1. General

2. Conditions

3. Scope of work

A. This section includes all material, equipment, tools and workmanship related to the supply and installation of fume hoods and accessories as shown and specified in the attached drawings.

B. Included work

- .1 Standard steel base cabinets
- .2 Fume hoods
- .3 Countertops underneath the hoods
- .4 Sinks, cup sinks and plumbing service fittings integrated in the hoods
- .5 Electrical outlets mounted on the hoods

C. Related work

- .1 Plumbing, wiring and ventilation connections
- .2 Installation of a coved base at the base section of cabinet

4. Standards and Regulations

- A. ASHRAE Standard ANSI/ASHRAE 110.2016 – Methods of Testing Performance of Laboratory Fume hoods.
- B. ANSI/AIHA Z9.5-2012 *An American National Standard for Laboratory Ventilation*
- C. Standards and regulations IM15128-2013, Laboratory fume hood - Canada Public Work.
- D. Standard NFPA 30 – Flammable and Combustible Liquids Code and NFPA 45, 2000 National Fire Protection Association.
- E. SEFA 1-2010 - Laboratory Fume Hoods Recommended Practices
- F. OSHA 1910.1450 Occupational Exposure to Hazardous Chemicals in Laboratories
- G. CSA Standard C22.2 No. 1010.1-92 & CSA-US
- H. Prudent Practices in the Laboratory: Handling and Disposal of Chemicals (2011), National Research Council
- I. UL 61010A-1, 1st Edition – Electrical Equipment for Laboratory Use, Part 1: General Requirements

5. Shop drawings

- A. Fume Hoods shop drawings shall include :
 - .1 Elevations and plan view location of the fume hoods.
 - .2 Construction details showing inside (I.D.) and outside dimensions (O.D.), openings, exhaust requirements and duct sizes.
 - .3 Locations of plumbing, electrical and ventilation services provided with the hoods.

6. Qualifications

- A. This document is based on the specifications provided by *Bedcolab Ltd* and must be referred to the minimum quality requirement.
- B. The fume hood manufacturer must have an ISO-9001 accreditation and his products must meet the requirements of the *Scientific Equipment & Furniture Association* (SEFA) and more specifically meet the *SEFA 1-2010 Laboratory Fume hoods Recommended Practices*.
- C. The chosen contractor must be a laboratory fume hood manufacturer with a minimum of 5 years of fume hood manufacturing experience and have demonstrated his ability to provide equipment meeting the stated quality standards. He must also be able to demonstrate that he has installed projects of similar scope within the required time schedule.
- D. Any other manufacturer must be qualified by the architect prior to the bid opening. As part of the qualification process, in addition to demonstrating their ability to produce, supply and install the required hoods, the contractor must supply a copy of the following documents:
 - .1 A typical fume hood drawing
 - .2 A fume hood catalogue
 - .3 ISO 9001 certification

7. Warranty

- A. The contractor must provide written certification that all hood components described in this section are covered by a **three (3) year** warranty against all defects in material or workmanship, including installation. The warranty taking effect on the date of substantial completion of that section.
- B. Warranty and maintenance material must be remitted to the owner within fifteen days following the said date.

8. General material

- A. Commercial gauge steel in compliance with the standards.

- B. ASTM A167-96 approved type 316 stainless steel, with # 4 satin finish.
- C. CAN/CGBS-12.1 approved safety laminated glass, premium quality, 6 mm thick.
- D. *Dow Corning # 786* mildew resistant silicone sealer, clear or white and/or *Dow Corning # 999* chemical resistant sealer, black, according to need.

9. Chemical fume hood

A. General

- a. All chemical fume hoods must be built according to the *Scientific Equipment & Furniture Association SEFA-1-2002* standards. All hoods must be used as closed working areas, allowing vapors, fumes or other products within the work enclosure to be evacuated safely.
- b. All hoods must be correctly installed and connected (by a mechanical contractor barring any indication to the contrary) to an adequate exhaust system with a face velocity that complies to the applicable regulations
- c. All hoods must be built in order to minimize loss of static pressure, with appropriate openings and adequate exhaust duct locations.
- d. Air must sweep the working area to prevent the formation of turbulence inside the hood and thus reducing the risks of heavy vapors or other contaminants to escape from the frontal area of the hood.

10. Vanguard Balanced Air Fume Hoods

- A. These hoods are equipped with an air deflector system that controls the incoming air velocity thus providing a constant air exhaust volume.
- B. Equipped with by-pass grills located at the front upper section of the hood that open as the sash is closed, air sweeps the air foil counter ledge therefore providing a constant air flow over the work surface.
- C. The sash opening is beveled in order to reduce dead air pockets and air turbulence.
- D. This hood can be modified to accommodate a variable air volume (VAV) system. An adjustable panel made of the same material as the inner shell is then added to the air deflection device over the sash opening to provide a better calibration of the system.

E. Materials

- a. All steel used in the fabrication of the exterior panels is of premium quality and is finished as described in the furniture section.
- b. All screws used to fix the exterior structural channels are zinc plated steel and all interior liner hardware is made of chemical resistant plastic.

- c. The air foil at the bottom of the sash is made of type 316 stainless steel with openings at both ends for electrical cord access to allow for the sash to be fully closed.
- d. The sash window and the glass protecting the light fixture are made of 1/4" (6 mm) safety laminated glass.
- e. The sash side tracks are made of black corrosion resistant polyvinyl chloride (PVC).
- f. The restraint cables of the sash are made of 1/8" (3 mm) stainless steel wire with 1 1/2" (38 mm) ball-bearing nylon roller pulleys.
- g. Exhaust ducts are made of type 316, 18 gauge (1.2 mm) stainless steel with rounded edges to allow air exhaust with minimum turbulence.

F. Choice of interior liners

- a. 3/16" (5 mm) fiber reinforced Polyresin plastic *Haysite* H193 with white smooth chemical resistant finish. **(FRP)**
- b. 1/4" (6 mm) white Phenolic resin panels. **(WPR)**
- c. Type 304, 18 gauge (1.2 mm) stainless steel panels mechanically fastened. **(SP4)**
- d. Type 316, 18 gauge (1.2 mm) stainless steel panels mechanically fastened. **(SP6)**
- e. Type 304, 18 gauge (1.2 mm) stainless steel all welded interior with seamless coved corners. **(SW4)**
- f. Type 316, 18 gauge (1.2 mm) stainless steel all welded interior with seamless coved corners. **(SW6)**

G. Construction:

- a. The hood structure shall be a double wall construction with steel exterior panels painted with the same process as the furniture and a choice of interior finish as described under section F. All steel structural channels, supports and remote control faucet mechanisms are installed within the wall structure.
- b. The hood structure must be self supporting, forming a complete rigid structure to support the inside lining, allowing the replacement of interior lining panels without the need to remove the hood from his installed position.
- c. Wall thickness should not exceed 4 3/4" (120 mm) providing a maximum inner working area.

- d. Access to faucet valves installed within the side walls is provided through removable access panels made with the same material as the inner lining and removable painted steel exterior side panels.
- e. The sash is a vertical opening type permitting a maximum opening height of 27¼". The sash is designed to have a 30¾" clear view of the inside of the hood. A full length balanced counterweight mechanism (with stainless steel cables and pulleys), located at the back of the hood keeps sash on track and provides a fingertip control of the sash height. The full width aerodynamically designed handle is made of corrosion resistant black plastic.
- f. The picture-frame contoured face opening must be beveled with rounded corners to form an aerodynamic opening.
- g. The air foil at the bottom of opening is made of a type 316, 16 gauge (1.5 mm) stainless steel with electrical cord opening on both sides allowing the sash to close fully. The air foil is designed to continuously provide a minimum 1" (25 mm) opening under the foil to the work surface even when the sash is in the fully closed position.
- h. Interior baffles are made of the same material as the inner lining of the hood and are at a factory-set position for optimal containment.
- i. The fume hood is equipped with a fluorescent light fixture, a light switch and two double 120V/20A electrical outlets on the front posts. All electrical components are pre-wired to a junction box located on top of the hood and are CSA-US/UL approved.
- j. The fluorescent light fixture, including two maximum width tubes based on the size of the hood, is installed on the exterior side of the roof of the hood with a ¼" (6 mm) laminated safety glass to insulate the lamps from vapors or fumes inside the hood. The chosen lamp must supply a minimum of 80 feet/candle at the working surface.
- k. Hoods with fiber reinforced plastic Haysite H193, or Phenolic resin linings, are supplied with all interior hardware made of chemical resistant plastic.
- l. The hoods are designed with the following minimum inside dimensions for working surface maximization: 26½" working surface depth between the baffles and the sash interior; 48" clear height between the working surface and the inside top of the hood.

11. Vanguard Variable Air Volume (VAV) fume hoods

- A. These hoods combined with an HVAC control system are designed to vary the hood's exhaust rate to maintain a constant average face velocity throughout the sash travel.

- a. In addition, the aerodynamic airfoil located under the sash creates a sweeping air movement at the work surface to reduce dead-air pockets and air turbulence at the work surface front.
- b. Equipped with by-pass grills located on top at the upper front section of the hood. An interior adjustable panel made of the same material as the inner shell is then added to the air deflection device over the sash opening to provide a better calibration of the system.
- c. The sash opening is beveled in order to reduce dead air pockets and air turbulence.
- d. The necessary cut outs and bracket supports for the incorporation of the VAV Control hardware are supplied upon request.

B. Materials

- a. All steel used in the fabrication of the exterior panels is of premium quality and is finished as described in the furniture section.
- b. All screws used to fix the exterior structural profile are zinc plated steel type and all interior liner hardware are made of chemical resistant plastic.
- c. The air foil at the bottom of the sash is made of type 316 stainless steel with opening at both ends for electrical cord access to permit a full closing of the sash window.
- d. The sash window and the glass protecting the light fixture are made of 1/4" (6 mm) laminated safety glass.
- e. The side tracks of the sash are made of black corrosion resistant polyvinyl chloride (PVC).
- f. The restraint cables of the sash are made of 1/8" (3 mm) stainless steel wire with 1 1/2" (38 mm) ball-bearing nylon roller pulley.
- g. Exhaust ducts are made of type 316, 18 gauge (1.2 mm) stainless steel with rounded edges to allow air exhaust without any turbulence.

C. Choice of interior liners

- a. 3/16" (6 mm) fiber reinforced Polyresin plastic Haysite H193 with white smooth chemical resistant finish. **(FRP)**

- b. ¼" white Phenolic resin panels. **(WPR)**
- c. Type 304, 18 gauge (1.2 mm) stainless steel panels mechanically fastened. **(SP4)**
- d. Type 316, 18 gauge (1.2 mm) stainless steel panels mechanically fastened. **(SP6)**
- e. Type 304, 18 gauge (1.2 mm) stainless steel all welded interior with seamless coved corners. **(SW4)**
- f. Type 316, 18 gauge (1.2 mm) stainless steel all welded interior with seamless coved corners. **(SW6)**

D. Construction:

- a. The hood structure is a double wall construction with painted steel exterior panels same type as for the furniture and a choice of interior finish as described above. All steel structural channels, supports and remote control faucet mechanisms are installed within the wall structure.
- b. The hood structure must be self supporting, forming a complete and rigid structure to support the inside lining allowing the replacement of interior lining panels without the need to remove the hood from his installed position.
- c. Wall thickness should not exceed 4 ¾" (120 mm) providing a maximum inner working area.
- d. Access to faucet valves installed within the side walls is provided through removable interior access panels made with the same material as the inside lining and removable painted steel side panels on the outside.
- e. The sash is a vertical opening type permitting a maximum opening height of 27¼". The sash is designed to have a 30¾" clear view of the inside of the hood. A full length balanced counterweight mechanism (with stainless steel cables and pulleys), located at the back of the hood keeps sash in track and provides a fingertip control of the sash height. The full width aerodynamically designed handle is made of corrosion resistant black plastic.
- f. The picture-frame contoured face opening must be beveled with rounded corner to form an aerodynamic opening.
- g. The air foil at the bottom of opening is made of a type 316, 16 gauge (1.5 mm) stainless steel with electrical cord opening on both sides allowing the sash to close fully. The air foil is designed to continuously provide a minimum 1" (25 mm) opening under the foil to the work surface even when the sash is in fully closed position.

- h. Interior baffles are made of the same material as the inner lining of the hood and are at a factory-set position for optimal containment.
- i. The fume hood is equipped with a fluorescent light fixture, a light switch and two double 120V/20A electrical outlets on the front posts. All electrical components are pre-wired to a junction box located on top of the hood and are CSA-US/UL approved.
- j. The fluorescent light fixture, including two maximum width tubes based on the size of the hood, is installed on the exterior side of the roof of the hood with a ¼" (6 mm) laminated safety glass to insulate the lamps from vapors or fumes inside the hood. The chosen lamp must supply a minimum of 80 feet/candle at the working surface.
- k. Hoods with *white fiber reinforced plastic Polyester or Phenolic resin linings*, are supplied with all interior hardware made of chemical resistant plastic.
- l. The hoods are designed with the following minimum inside dimensions for working surface maximization: 26½" working surface depth between the baffles and the sash interior; 48" clear height between the working surface and the inside top of the hood.

12. Vanguard Auxiliary air fume hoods

- A. These hoods have been designed to preserve energy produced in heating or cooling the rooms where hoods are installed.
- B. These hoods are equipped with a separate duct located over the sash through which a maximum of 70% of the total air exhausted by the blower is induced into the fume hood chamber. The remaining 30 % of the total amount of exhausted air is removed from the room.

C. Materials

- a. All steel used in the fabrication of the exterior panels is of premium quality and is finished as described in the furniture section.
- b. All screws used to fix the exterior structural channels are zinc plated steel and all interior liner hardware is made of chemical resistant plastic.
- c. The air foil at the bottom of the sash is made of type 316 stainless steel with openings at both ends for electrical cord access to allow for the sash to be fully closed.
- d. The sash window and the glass protecting the light fixture are made of 1/4" (6 mm) safety laminated glass.
- e. The side tracks of the sash are made of black corrosion resistant polyvinyl chloride (PVC).
- f. The restraint cables of the sash are made of 1/8" (3 mm) stainless steel wire with 1 1/2" (38 mm) ball-bearing nylon roller pulleys.
- g. Exhaust ducts are made of type 316, 18 gauge (1.2 mm) stainless steel with rounded edges to allow air exhaust with minimum turbulence
- h. The air intake ducts (which are part of the air intake system itself) are located over the sash. They are of rectangular shape and are made of painted steel. They exceed the top of hood by 4" (101 mm) for easy connection.

D. Choice of interior liners

- a. 3/16" (6 mm) fiber reinforced Polyresin plastic *Haysite H193* with white smooth chemical resistant finish. **(FRP)**
- b. 1/4" white Phenolic resin panels. **(WPR)**
- c. Type 304, 18 gauge (1.2 mm) stainless steel panels mechanically fastened. **(SP4)**

- d. Type 316, 18 gauge (1.2 mm) stainless steel panels mechanically fastened. **(SP6)**
- e. Type 304, 18 gauge (1.2 mm) stainless steel all welded interior with seamless coved corners. **(SW4)**
- f. Type 316, 18 gauge (1.2 mm) stainless steel all welded interior with seamless coved corners. **(SW6)**

E. Construction

- a. The hood structure is a double wall construction with steel exterior panels painted with the same process as the furniture and a choice of interior finish as described above. All steel structural channels, supports and remote control faucet mechanisms are installed within the wall structure.
- b. The hood structure must be self supporting, forming a complete rigid structure to support the inside lining, allowing the replacement of interior lining panels without the need to remove the hood from his installed position.
- c. Wall thickness should not exceed 4 ¾" (120 mm) providing a maximum inner working area.
- d. Access to faucet valves installed within the side walls is provided through removable interior access panels made with the same material as the inner lining and removable painted steel exterior side panels.
- e. The sash is a vertical opening type permitting a maximum opening height of 27¼". The sash is designed to have a 30¾" clear view of the inside of the hood. A full length balanced counterweight mechanism (with stainless steel cables and pulleys), located at the back of the hood keeps sash in track and provides a fingertip control of the sash height. The full width aerodynamically designed handle is made of corrosion resistant black plastic.
- f. The picture-frame contoured face opening must be beveled with rounded corners to form an aerodynamic opening.
- g. The air foil at the bottom of opening is made of a type 316, 16 gauge (1.5 mm) stainless steel with electrical cord opening on both sides allowing the sash to close fully. The air foil is designed to continuously provide a minimum 1" (25 mm) opening under the foil to the work surface even when the sash is in the fully closed position.
- h. The plenum chamber is installed above the sash opening. Made of painted steel, it replaces the front panel and is equipped with a rectangular shaped air intake duct, a grill in its lower section and deflectors which distribute the air flow either toward the front opening or the inside of the hood according to the sash opening.

- i. Interior baffles are made of the same material as the inner lining of the hood and are at a factory-set position for optimal containment.
- j. The fume hood is equipped with a fluorescent light fixture, a light switch and two double 120V/20A electrical outlets on the front posts. All electrical components are pre-wired to a junction box located on top of the hood and are CSA-US/UL approved.
- k. The fluorescent light fixture, including two maximum width tubes based on the size of the hood, is installed on the exterior side of the roof of the hood with a ¼" (6 mm) laminated safety glass to insulate the lamps from vapors or fumes inside the hood. The chosen lamp must supply a minimum of 80 feet/candle at the working surface.
- l. Hoods with *white polyester fiber reinforced plastic or Phenolic resin linings* are supplied with all interior hardware made of chemical resistant plastic.
- m. The hoods are designed with the following minimum inside dimensions for working surface maximization: 26½" working surface depth between the baffles and the sash interior; 48" clear height between the working surface and the inside top of the hood.

13. Vanguard Fully Accessible Fume Hoods (ADA)

A. These hoods have the general performance characteristics as the Balanced Air hood with the addition that all services are located at an accessible height for wheel chair operators. A stainless steel spill trough is located under the front portion of the hood to prevent any chemical spillage.

B. Material

- a. All steel used in the fabrication of the exterior panels is of premium quality and is finished as described in the furniture section.
- b. All screws used to fix the exterior structural channels are zinc plated steel and all interior liner hardware are made of chemical resistant plastic.
- c. The air foil at the bottom of the sash is made of type 316 stainless steel with openings at both ends for electrical cord access to allow for the sash to be fully closed.
- d. The sash window and the glass protecting the light fixture are made of 1/4" (6 mm) safety laminated glass.
- e. The side tracks of the sash are made of black corrosion resistant polyvinyl chloride (PVC).
- f. The restraint cables of the sash are made of 1/8" (3 mm) stainless steel wire with 1 1/2" (38 mm) ball-bearing nylon roller pulleys.
- g. Exhaust ducts are made of type 316, 18 gauge (1.2 mm) stainless steel with rounded edges to allow air exhaust with minimum turbulence
- h. The spill trough under the air foil is made of T. 304 stainless steel.

C. Choice of interior liners

- a. 3/16" (5 mm) fiber reinforced Polyresin plastic *Haysite H193* with white smooth chemical resistant finish. **(FRP)**
- b. 1/4" white Phenolic resin panels. **(WPR)**
- c. Type 304, 18 gauge (1.2 mm) stainless steel panels mechanically fastened. **(SP4)**
- d. Type 316, 18 gauge (1.2 mm) stainless steel panels mechanically fastened. **(SP6)**
- e. Type 304, 18 gauge (1.2 mm) stainless steel all welded interior with seamless coved corners. **(SW4)**

- f. Type 316, 18 gauge (1.2 mm) stainless steel all welded interior with seamless coved corners. (SW6)

D. Construction

- a. The hood structure is a double wall construction with steel exterior panels painted with the same process as for the furniture and a choice of interior finish as described above. All steel structural channels, supports and remote control faucet mechanisms are installed within the wall structure.
- b. The hood structure must be self supporting, forming a complete rigid structure to support the inside lining, allowing the replacement of interior lining panels without the need to remove the hood from his installed position.
- c. Wall thickness should not exceed 4 ¾" (120 mm) providing a maximum inner working area.
- d. Access to faucet valves installed within the side walls is provided through removable interior access panels made with the same material as the inner lining and removable painted exterior side panels.
- e. The sash is a vertical opening type permitting a maximum opening height of 27¼". The sash is designed to have a 30¾" clear view of the inside of the hood. A full length balanced counterweight mechanism (with stainless steel cables and pulleys), located at the back of the hood keeps sash on track and provides a fingertip control of the sash height. The full width aerodynamically designed handle is made of corrosion resistant black plastic.
- f. The picture-frame contoured face opening must be beveled with rounded corners to form an aerodynamic opening.
- g. The air foil at the bottom of opening is made of a type 316, 16 gauge (1.5 mm) stainless steel with electrical cord opening on both sides allowing the sash to close fully. The air foil is designed to continuously provide a minimum 1" (25 mm) opening under the foil to the work surface even when the sash is in the fully closed position.
- h. Under the air foil is located a stainless steel spill trough the full length of the hood to prevent any spillage from the working surface.
- i. Interior baffles are made of the same material as the inner lining of the hood and are at a factory-set position for optimal containment.
- j. The fume hood is equipped with a fluorescent light fixture, a light switch located at the bottom of the left post and one double 120V/20A electrical outlets on the right front post. All electrical components are pre-wired to a junction box located on top of the hood and are CSA-US/UL approved.

- k. The fluorescent light fixture, including two maximum width tubes based on the size of the hood, is installed on the exterior side of the roof of the hood with a ¼" (6 mm) laminated safety glass to insulate the lamps from vapor or fumes inside the hood. The chosen lamp must supply a minimum of 80 feet/candle at the working surface.
- l. Hoods with *white polyester fiber reinforced plastic or Phenolic resin linings*, are supplied with all interior hardware made of chemical resistant plastic.
- m. The hoods are designed with the following minimum inside dimensions for working surface maximization: 26½" working surface depth between the baffles and the sash interior; 48" clear height between the working surface and the inside top of the hood.

14. Vanguard Radio Isotope Fume Hood

- A. The design of the radio-isotope fume hood provides a safe environment for working with isotope radiation. The fume hood has the same general performance characteristics as the Balanced Air fume hood with the addition that the interior is constructed of 18 gauge type 304 #4 finish stainless steel to prevent absorption of radioactive and corrosive chemicals.
- B. The fume chamber and integral work surface consist of a welded seamless construction with all coved corners. This construction feature reduces the chance of build-up and allows for a simplified and thorough decontamination.

C. Material

- a. All steel used in the fabrication of the exterior panels is of premium quality and is finished as described in the furniture section.
- b. All screws used to fix the exterior structural channels are zinc plated steel type and all interior liner hardware is made of chemical resistant plastic.
- c. The air foil at the bottom of the sash is made of type 316 stainless steel with openings at both ends for electrical cord access to allow for the sash to be fully closed.
- d. The sash window and the glass protecting the light fixture are made of 1/4" (6 mm) safety laminated glass.
- e. The side tracks of the sash are made of black corrosion resistant polyvinyl chloride (PVC).
- f. The restraint cables of the sash are made of 1/8" (3 mm) stainless steel wire with 1 1/2" (38 mm) ball-bearing nylon rollers pulleys.
- g. Exhaust ducts are made of type 316, 18 gauge (1.2 mm) stainless steel with rounded edges to allow air exhaust with minimum turbulence and are welded seamless to the inner shell.

D. Construction

- a. The hood structure is a double wall construction with painted steel exterior panels same type as for the furniture with an interior finish as described above. All steel structural channels, supports and remote control faucet mechanism are installed within the wall structure.
- b. The hood structure must be self supporting, forming a complete rigid structure to support the inside lining and allowing the replacement of the interior lining without the need to remove the hood from his installed position.

- c. Wall thickness should not exceed 4 ¾" (120 mm) providing a maximum inner working area.
- d. Access to faucet valves installed within the side walls is provided through removable interior access panels made with the same material as the inner lining and removable painted steel exterior side panels.
- e. The sash is a vertical opening type permitting a maximum opening height of 27¼". The sash is designed to have a 30¾" clear view of the inside of the hood. A full length balanced counterweight mechanism (with stainless steel cables and pulleys), located at the back of the hood keeps sash on track and provides a fingertip control of the sash height. The handle with aerodynamically designed handle is made of corrosion resistant black plastic.
- f. The picture-frame contoured face opening must be beveled with rounded corners to form an aerodynamic opening.
- g. The air foil at the bottom of opening is made of a type 316, 16 gauge (1.5 mm) stainless steel with electrical cord opening on both sides allowing the sash to close fully. The air foil is designed to continuously provide a minimum 1" (25 mm) opening under the foil to the work surface even when the sash is in the fully closed position.
- h. Interior baffles are made of the same material as the inner lining of the hood and are at a factory-set position for optimal containment.
- i. The fume hood is equipped with a fluorescent light fixture, a light switch and two double 120V/20A electrical outlets on the front posts. All electrical components are pre-wired to a junction box located on top of the hood and are CSA-US/UL approved.
- j. The fluorescent light fixture, including two maximum width tubes based on the size of the hood, is installed on the exterior side of the roof of the hood with a ¼" (6 mm) laminated safety glass to insulate the lamps from vapors or fumes inside the hood. The chosen lamp must supply a minimum of 80 feet/candle at the working surface.
- k. The hoods are designed with the following minimum inside dimensions for working surface maximization: 26½" working surface depth between the baffles and the sash interior; 48" clear height between the working surface and the inside top of the hood.

15. Vanguard Perchloric Acid Fume Hood

- A. The Perchloric Acid fume hood has the same general performance characteristics as the Balanced Air fume hood with the additional feature of a coved seamless welded interior

cavity using type 316 # 4 finish stainless steel as recommended by insurance Underwriters.

- B. The interior cavity also has an integral full width drain trough to facilitate the recommended frequent and thorough wash-downs.

C. Material

- a. All steel used in the fabrication of the exterior panels is of premium quality and is finished as described in the furniture section.
- b. All screws used to fix the exterior structural channels are zinc plated steel type and all interior liner hardware are made of chemical resistant plastic.
- c. The air foil at the bottom of the sash is made of type 316 stainless steel with openings at both ends for electrical cord access to allow for the sash to be fully closed.
- d. The sash window and the glass protecting the light fixture are made of 1/4" (6 mm) safety laminated glass.
- e. The side tracks of the sash are made of black corrosion resistant polyvinyl chloride (PVC).
- f. The restraint cables of the sash are made of 1/8" (3 mm) stainless steel wire with 1 1/2" (38 mm) ball-bearing nylon rollers pulleys.
- g. Exhaust ducts are made of type 316, 18 gauge (1.2 mm) stainless steel with rounded edges to allow air exhaust with minimum turbulence and are welded seamless to the inner shell.

D. Construction

- a. The hood structure is a double wall construction with painted steel exterior panels same type as for the furniture with an interior finish as described above. All steel structural channels, supports and remote control faucet mechanism are installed within the wall structure.
- b. The hood structure must be self supporting, forming a complete rigid structure to support the inside lining and allowing the replacement of the interior lining without the need to remove the hood from his installed position.
- c. Wall thickness should not exceed 4 3/4" (120 mm) providing a maximum inner working area.
- d. Access to faucet valves installed within the side walls is provided through removable interior access panels made with the same material as the inner lining and removable painted steel exterior side panels.

- e. The sash is a vertical opening type permitting a maximum opening height of 27¼". The sash is designed to have a 30¾" clear view of the inside of the hood. A full length balanced counterweight mechanism (with stainless steel cables and pulleys), located at the back of the hood keeps sash on track and provides a fingertip control of the sash height. The full width aerodynamically designed handle is made of corrosion resistant plastic.
- f. The picture-frame contoured face opening must be beveled with rounded corners to form an aerodynamic opening.
- g. The air foil at the bottom of opening is made of a type 316, 16 gauge (1.5 mm) stainless steel with electrical cord opening on both sides allowing the sash to close fully. The air foil is designed to continuously provide a minimum 1" (25 mm) opening under the foil to the work surface even when the sash is in the fully closed position.
- h. Within the baffle arrangement in the upper interior hood, a ¾" diameter PVC spray pipe is provided for periodic wash-down behind the baffles.
- i. A remote control valve is provided on the upper right front post to operate the interior wash-down. The control must be operated manually according to the quantity and frequency of perchloric acids used in the hood.
- j. Interior baffles are made of the same material as the inner lining of the hood and are at a factory-set position for optimal containment. As an option, the baffles can be equipped with a single point adjustment handle to allow the operator to adjust the baffle without having to insert the head inside the hood. All baffle supports and hardware are made of chemical resistant plastic.
- k. The fume hood is equipped with a fluorescent light fixture, a light switch and two double 120V/20A electrical outlets on the front posts. All electrical components are pre-wired to a junction box located on top of the hood and are CSA-US/UL approved.
- l. The fluorescent light fixture, including two maximum width tubes based on the size of the hood, is installed on the exterior side of the roof of the hood with a ¼" (6 mm) laminated safety glass to insulate the lamps from vapors or fumes inside the hood. The chosen lamp must supply a minimum of 80 feet/candle at the working surface.
- m. The hoods are designed with the following minimum inside dimensions for working surface maximization: 26½" working surface depth between the baffles and the sash interior; 48" clear height between the working surface and the inside top of the hood.

16. Fume hood base cabinets

A. The cabinets or tables used under fume hoods must be of a rigid construction to provide adequate support for the hood and its accessories.

B. All units are built according to the *Forte Inset* laboratory casework system from **Bedcolab Ltd**

C. “Acid” or “Base” storage cabinets:

- .a Acid storage cabinets will be of the same construction than the standard base cabinets, with a one piece white chemical resistant polyethylene (HDPE) interior box and doors lined with the same material ¼" (6 mm) thick. Three integral shelf position supports are located on each side of the box. The bottom is equipped with an integral ¼" high edge to prevent leakage to the exterior of the cabinet.
- .b Air grills are provided at top and bottom of each door for air circulation.
- .c Each unit comes with an adjustable white chemical resistant polyethylene (HDPE) perforated shelf.
- .d Each unit is labelled "ACIDS – DANGER" for clear identification.
- .e All interior hardware components are non-metallic.

D. Flammable solvent storage units :

- a. Construction shall meet O.S.H.A. 1910-105(d)(3), comply with *N.F.P.A.* Flammable and combustible liquids Code no. 30 and be UL certified..
- b. They shall be made of 18 gauge (1.2 mm) thick cold rolled steel with double wall all welded construction. The floor shall be made of galvanized steel and be recessed 2" (51 mm) below the front opening of the cabinet.
- c. The cabinets shall be equipped with four 5/16" (8 mm) diameter threaded bolt type steel levelers as on the standard base cabinets.
- d. The back of the cabinet shall be supplied with two 1½" (38 mm) fire baffle vents.
- e. Each cabinet shall be equipped with an adjustable galvanized 16 gauge (1.5 mm) steel shelf.
- f. Each cabinet shall be clearly identified as such with the inscription «FLAMMABLE KEEP FIRE AWAY».
- g. Cabinet doors are equipped with a continuous piano hinge and can be equipped with an optional automatic emergency closing device.

E. Tables

- a. Tables are of steel construction with the same finish as the hood exterior panels and are made of two fully welded leg sets mechanically fastened to front and rear aprons.
- b. Depending on the table length, one or multiple drawers can be installed in the apron. Drawer construction and hardware are the same as for standard cabinets.
- c. Each leg is supplied with an adjustable leveler the same construction as for standard cabinets.

F. Remote control units

- a. Remote control units are made of steel with the same finish as the hood exterior panels. Doors are 75% of the unit's height with a fixed upper front panel.
- b. Back panels are removable from inside the unit and no shelves are provided.
- c. Units are supplied with four adjustable levelers.

G. Exterior hood panels and painted steel support furniture finishing:

- a. When fabrication of unit is completed, all surfaces shall be free of scratches, spot weld marks or material imperfections. Welds will be ground smooth where necessary. The unit will be washed using a three stage iron phosphate process for proper surface preparation, and subsequently dried in a dry off oven to remove all traces of humidity.
- b. A high quality chemical resistant polyurethane paint will then be applied to all surfaces including the interior of door and drawer panels using an electrostatic spray process. The parts will pass through a baking oven for duration and at a temperature as recommended by the paint manufacturer. Painted surfaces will conform to A.A.M.A. 2603.
- c. The painted surfaces will meet or exceed the SEFA 8-M specification for chemical resistance as specified by the “Scientific Equipment and Furniture Association” and will contribute to LEED credits

.4 Technical Performance:

- .1 Adhesion to substrate: 100% 5B (ASTM D3359)
- .2 Hardness: 3H (ASTM D3363)
- .3 Glosses: 60 +/- 5 units on 60°

- .4 Flexibility: ¼” Conical Mandrel (ASTM D522)
- .5 Impact resistances: 100 in-lb direct: 100 in-lb reverse (ASTM D2794)
- .6 Corrosion resistance: 1000 hrs less 1/16” in creepage over B-1000 treated test panels (ASTM B117)
- .7 Humidity resistances: 1000 hrs no blistering over B-1000 treated test panels (ASTM D2247)

.4 **Colors:** Twenty colors are available as per the *Bedcolab* color chart. Cabinets may be painted in one solid color or a two color scheme may be applied, where all cabinet bodies are painted one color and the doors and drawers are painted a second color.

18. Fume hood accessories :

A. Service fittings :

- a. Plumbing fittings shall be Water Saver.
- b. All are remote control type with the inside hood components finished with an acid and solvent resistant epoxy coat. The remote control valve is located on the exterior front post and is chrome plated.
- c. Water faucets are supplied with a rigid or swivel gooseneck vacuum breaker and nozzle.
- d. All other fittings are provided with angled nozzle.
- e. Typical service fitting models are from Water Saver Color Tech front type as follows:

- i. Cold water CT740W-9RSVB
- ii. Mixing water CT740W (2X)-9RSVB
- iii. Gas CT740G-CR
- iv. Air CT740A-CR
- v. Vacuum CT740V-CR

B. Sinks and Cup sinks

- a. Cup sinks are solid epoxy resin or stainless steel. Inside dimensions are 6" X 3" (152 mm X 76 mm) with a 1 ½" (38 mm) threaded tailpiece.
- b. Sinks are solid epoxy resin. Inside dimension are _____ with a 1 ½" (38 mm) sink outlet and tailpiece.

C. Choice of countertop

- a. **Modified thermosetting epoxy resin countertop.** Black. Thickness of top is 1 ¼" (32 mm) on the sides and 1" (25 mm) in the central portion of the hood creating a cavity to contain spills inside the hood chamber.
- b. **Stainless steel countertop.** Fabricated using type 316, 18 gauge (1.2 mm) stainless steel with a no. 4 satin finish. Top is bonded to a particle board core to prevent torsion or distortion. Top comes with a ¼" (6 mm) marine edge to contain spills inside the hood chamber.

D. Furring panels

- a. All hood drawings must show painted steel removable furring panels located between the top of the hood and the underside of the ceiling, on the front both sides of the hood.
- b. These panels should have the same quality finish and color as on the cabinets and hoods.