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**OPERATION & MAINTENANCE MANUAL**  
**Laboratory casework systems & Fume hoods**  
**Project: Xxxx**

**LABORATORY CASEWORK**

Items Description: All parts made from high-quality cold rolled steel. Each unit is a complete, solid, stand-alone component. Their thermosetting enamel finish is resistant to most common chemicals used in a laboratory.

- Conventional Base Cabinet
- Suspended Base Cabinet
- Acid Storage Cabinet
- Flammable Storage Cabinet
- Student Drawer Cabinet
- Overhead Cabinet (Wall Case)
- Overhead Shelving and Support
- Tall Storage Cabinet (Floor Case)
- Table Frame
- Filler Panel

Recommended Practices of Maintenance

Clean periodically with a wet rag or sponge using a solution of clean water and soap to remove stain, use a non-abrasive product such as “Bon Ami” or “Fantastic”, never use steel wool, it might scratch the finish.

Door Operations

If door does not open or close freely, pour Graphite powder between leaves of hinges.

If door does not stay closed, adjust roller catch by un-tightening the two holding screws located on door inside panel, place roller catch to the proper position in order to catch the indentation in post-cover once in closed position (without having to put extreme pull to open door.)

Drawer Operations

No special maintenance required other than greasing slide arm roller if needed.

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Inside of Storage Cabinet

If strong solvents are used, it is recommended to dry immediately any spillage and it would also be wise to use a rubber mat to prevent softening of lining material.

At least once a day horizontal surface should be washed with clear water.

Steel wool and abrasives will wear out protective coat, thus are not recommended products.

List of Parts

- SS wire pull
- Spring Latch
- Drawer Metal Glider
- Hospital Type Hinge
- Rubber Door Bumper
- Leg Leveler
- Nylon Cap inside Cabinet to cover leveler adjustment holes
- Rails for sliding doors

Instructions

No special instructions are needed. We must mention **not to use excessive force when opening or closing doors and drawers as well as adjusting the shelves**. The structure was conceived for smooth handling. Never stand on the bottom floor of the furniture to use as a stepladder.

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**EPOXY RESIN COUNTERTOP**

Description

This 1” thick countertop is a monolithic and molded from a modified epoxy resin. The tops go through a special two-stage curing process assuring complete chemical reaction throughout the material, producing a uniform work surface. The epoxy resin material has the benefit of been non-flammable and non-absorbent.

The joints are connected and sealed on site with a modified thermo-hardening epoxy resin to make them waterproof and very strong.

Operating Practices

When using a "Bunsen" burner or electric hot plate, an isolating plate shall be placed under this equipment to protect the surface of the countertop.

Protect surface from intensive heat source.

Maintenance Practices

Clean regularly with soap and warm water then rinse off with cool water.

No special maintenance is required.

The life of the finish depends on proper use and regular maintenance.

## **STAINLESS STEEL COUNTER TOP AND SINKS**

### **Care and Maintenance**

Try to avoid prolonged contact of different metal part or other stainless steel part, especially if immersed in water or other chemical liquid. Even if stainless steel will not be damaged, this might cause an unpleasant stain.

Do not allow for any solution to evaporate on stainless steel.

Do not allow for any chlorides, bromides, iodides, thiocyanate, to remain on the surface without cause.

The best form of maintenance is frequent, regular cleanings. A little bit of cleaning on a regular basis is preferable to a major cleaning on a sporadic basis. The best method of preventative maintenance is to ensure that the sink is clean, dry and exposed to room atmosphere when no in use. Rinse and towel dry the sink after each use in order to minimize major cleanups. This is of particular importance if potentially corrosive chemicals were in contact with the sink or the counter top surface.

Keep the sink free of any standing water, which may build up mineral deposits. The quality of your water can affect the sink's appearance and this water quality will vary from building to building.

To clean your sink or the counter top surface, use the mildest cleaning procedure that will do the job effectively.

Always rinse the sink after using a cleaning agent, and wipe the sink dry to discourage any water spotting.

Rinse generously with clear water and dry off after use.

Remove normal dirt with soap and water, rinse with clear water and dry off.

For greases, clean with a hot solution containing 1 to 2 % of sodium met silicate or sodium phosphate, triadic or with organic solvents such as: carbon tetrachloride, alcohol or naphtha.

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Ink or paints can be cleaned with organic solvent such as “butyl acetate” or other similar solvent.

Other impregnated stains can be removed with metal polish according to instructions supplied with polishes.

Metallic scouring pads and steel wool pads must never be used to clean your sink or any utensils in the sink, as they will leave a residue of small iron particles. They may not even be readily visible, but they most certainly will lead to corrosion of the sink. (Non metallic Scotch-Brite scouring pads are available for this purpose.)

Do not leave any items in the sink overnight as they will trap water underneath which could lead to staining and discolouration of the sink surface. The unique properties of stainless steel are dependent upon exposure of the surface to the atmosphere.

It is not recommended to use chlorine bleach in the stainless steel sink or the counter top surface, as chlorine will attack the protective layer that makes stainless steel truly stainless. The risk of damage is proportional to the concentration of the chlorine and the duration of exposure between the sink and chlorine agent. Always dilute any antibacterial product used and wipe up any spills. Note: some antibacterial soap contains a chlorine compound.

Any cleaning or scrubbing to remove stubborn stains from the inside of the sink bowl or the counter top surface should follow the direction of the grain line. Any scrubbing across the grain will show as a scratch. Scrubbing in the same direction as the polish lines will blend in any surface scratches.

Stains and water spots anywhere on the sink or the counter top surface can be removed with a small amount of peek on a damp cloth. Rub the peek over the sink surface. Rinse and towel dry.

### **CORROSION RESISTANCE OF THE STAINLESS STEEL**

In the presence of oxygen, stainless steel forms a protective chromium oxide film. This is due to the addition of chromium in excess of 11.5% during the alloying stage. The further addition of nickel, in excess of 7%, gives superior corrosion resistance to the 300 series.

Maximum corrosion resistance is obtained with the addition of molybdenum to form TYPE 316, designed to resist attack under highly corrosive conditions.

As implied, stainless steel requires oxygen in order to be stainless. There are ways to make oxygen more plentiful. For example, an acid solution, which might otherwise corrode the steel, can be aerated to maintain the protective film.

Corrosion, or rusting, often reported soon after installation, has two main causes:

1. Contact Corrosion occurs when a piece of common carbon steel, copper, brass or other foreign material contacts the sink and destroys the passive protective film.
2. Pitting or Pinhole Corrosion occurs when chlorides attack the steel forming pits where galvanic cells are created. Acids chlorides are particularly severe, but even chlorine bleach can cause failure. The sink should be rinsed thoroughly after such contact. Type 316 steel should be specified if the sink would be subject to such conditions.

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**Chemical Data**

The chemical data below should be used as a guide to determine the type of stainless steel that will be appropriate for the application. The rating system denotes the level of resistance to corrosion for the different types of stainless steel (A = fully resistant, B= fairly resistant, C = not resistant). For applications involving chemicals or conditions not listed below, please consult you local Bedcolab sales representative.

<b>Substance (Conditions – strength &amp; temperature)</b>	<b>T316</b>	<b>T304</b>
Acetic Anhydride (90%, aerated, 180 degrees F)	B	C
Aluminium Fluoride (5%, 70 degrees F)	B	C
Aluminium Sulphate (10%, boiling)	A	B
Ammonium Bromide (5%, 70 degrees F)	B	C
Ammonium Sulphate (10%, boiling)	A	B
Bleaching Powder (dry)	A	C
Butyric Acid (saturated, boiling)	A	B
Calcium Bisulphite (aqueous solution, 300 lbs. pressure, 390 degrees F)	B	C
Calcium Hydroxide (50%, boiling)	A	C
Calcium Hypo chlorite (saturated, 70 degrees F)	A	C
Chloracetic Acid (70 degrees F)	B	C
Chlorine Gas (moist, 70 degrees F)	B	C
Chromic Acid (50%, boiling)	B	C
Ferric Chloride (1%, 70 degrees F)	B	C
Fluosilicic Acid (90%, 70 degrees F)	B	C
Formic Acid (10%, 180 degrees F)	A	C
Hydrochloric Acid (1% or less, 70 degrees F)	B	C
Iodine (dry, 70 degrees F)	A	C
Lactic Acid (10%, 150 degrees F)	B	C
Mercuric Chloride (2%, 70 degrees F)	B	C
Oxalic Acid (2.5%, 180 degrees F)	A	C
Phosphoric Acid (80%, 230 degrees F)	B	C
Salt Brine (70 degrees F)	A	C
Sauerkraut Brine (70 degrees F)	A	C
Sodium Hydroxide (melting, 600 degrees F)	B	C
Stannic Chloride (5%, 70 degrees F)	B	C
Sulphuric Acid (5%, 100 degrees F)	A	C
Zinc Chloride (saturated, 70 degrees F)	B	C

## **Vanguard Fume Hood technical specifications**

### **Description:**

Those Fume hoods are designed and manufactured as per *Recommended Practices Sefa 1 – 2002* of the *Scientific Equipment & Furniture Association*. The fume hoods must be used as a ventilated enclosure that, when connected to a properly designed laboratory ventilation system, will carry the undesirable effluents away from laboratory personnel.

The Fume hoods are balanced air type with a bypass system designed to control airflow patterns within the enclosure and manage the even distribution of air at the opening. That bypass system includes a grill on the top front panel to divert air from the face opening when the sash is lowered and an airfoil sill under the sash opening designed to enable smooth flow over the work surface.

The airfoil sill under the sash opening bring air to the working surface when the sash is lowered or closed to prevent potential risk of contaminate leakage.

### **Fume hood construction:**

The hood structure is consisting of a double wall with painted steel exterior panels and an inside lining. The walls enclose a steel structure to support the inside and outside panels and the plumbing and electrical fixtures.

The fume hood structure is self-supporting, forming a complete frame that support the exterior panels and the inside lining. The structure is design to permit the possibility of inside lining panels' replacement.

Access to plumbing service lines inside side walls are possible through inside access panel on each interior side of hood and from the exterior by removing exterior side panels.

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The airfoil sill under the sash opening is made of stainless steel type 316, 14 gauge (1.9 mm) thickness, providing a minimal opening of 1 inch (25 mm). The airfoil is equipped with top opening on each side to permit the passing of electrical wires and plugs under the sash opening when the door is fully closed.

Inside baffles are made of the same material as the inner finish of the hood. All baffles supports and adjustment controls are made of chemical resistant plastic.

The fume hood is equipped with a fluorescent light fixture, a light switch and two double 120V/15A 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 approved.

The fluorescent lamp, including two tubes of the maximum length possible, are installed on the top exterior of the hood with a laminated safety glass ¼" thick (6 mm), with sealed joint, to prevent fumes and chemicals to be in contact with the lamp.

All hoods with interior lining made of FRP and are equipped with metal free hardware.

The following inside dimensions permit a maximum utilisation of the hood: 33 inches (838 mm) of working surface depth between the inside baffles and the interior sash; 48 inches (1220 mm) of clear height between the working surface and the inside top of the hood.

**Materials:**

All of the cabinets and fume hoods steel components are grounded and polished at welding points and then prepared for finishing in a conveyORIZED 3 stages chemical process consisting of pulverization, neutralization and cleaning to remove any sign of grease, oil, dirt or any other substance. The steel is then coated with a high durability coat of chemical resistant thermosetting polyester and oven-baked as per *AAMA 603.8 and CGSB I-GP-300* standards.

All screws used to fix the exterior structural profile are zinc plated steel type and all interior liner fixations are made of plastic material.

The horizontal type sash window and the glass protecting the light fixture are made of 1/4" (6 mm ) safety laminated glass.

Exhaust ducts are located on top of the hood and made of type 316, 18 gauge (1,2 mm) stainless steel with coved corners to allow air exhaust without any turbulence.

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Information Labels located on the hood

**Hood identification:** This black background label is located on the right front post and indicates the CSA approval for United States and Canada. The label also indicates the following information:

- Model #
- Serial #
- Fabrication date
- Electrical rating (Volts, Amps, Hz)

**Operating Instructions:** This black background label is located on the left side front post and indicates the end user hood operating instructions.

**▲ Warning:** This white background label is located on top of fluorescent lamp and indicates the requirement of grounding conductor connection.

**Warning:** This white background label is located beside the junction box on top of the hood. It indicates that a certified electrician should perform all electrical connection.

**Warning:** This white background label is located beside the junction box on top of the hood. It indicates that the junction box contain more than one live circuit.

**Electric diagram:** A white background label is located on top of fluorescent lamp.

## **Vanguard fume hood installation instructions**

The fume hoods must be correctly installed and **connected to an adequate exhaust system** for a face velocity, which complies with the applicable regulations (by a mechanical contractor barring any indication to the contrary).

It is very important, for a safe utilisation of the hoods, to never remove the front stainless steel airfoil under the face opening and the inside baffles (in two sections) in the back of the hoods.

The hoods can be easily modified to accommodate a Variable air volume system (VAV). An adjustable panel, made of the same interior as the inside lining, is added to the hood to closed part of the by-pass system grill opening on the top front panel.

It is very important to follow these procedures before the utilisation of the hood:

1. Make sure that the exhaust system is on.
2. Make sure that there is a room intake air (natural or forced) equivalent to at least 90% of the fume hood exhaust air volume. A safe exhaust of the hood cannot be accomplished without an equivalent air make up to the laboratory.
3. Locate all equipments or accessories inside the hoods as far as possible from the front opening and at least 6 inches (150 mm). These equipments or accessories should be installed on legs to make sure there is an air circulation on the work surface level.

It is also important to follow those directives to make sure it is a safe utilisation of the hoods:

1. When the sash is open, avoid fast movement in front of the hood.
2. Minimise other personnel circulation than the end user in front of the hood.
3. The sash door has a protection function. It is safe to locate it at an opening permitting the necessary access and a maximal protection
4. The inside baffles should never be modified or removed without the manufacturer authorization.
5. Always keep the sash in closing position when you are not working in the hood.

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6. The hood should not be used as a chemical storage area. The chemical products should be kept as the minimum required by the work.
7. The hood should not be used for evacuation of perchloric acids, radioisotope products or any biological or bacteriological products without the manufacturer authorization.

**Maximum operating characteristics**

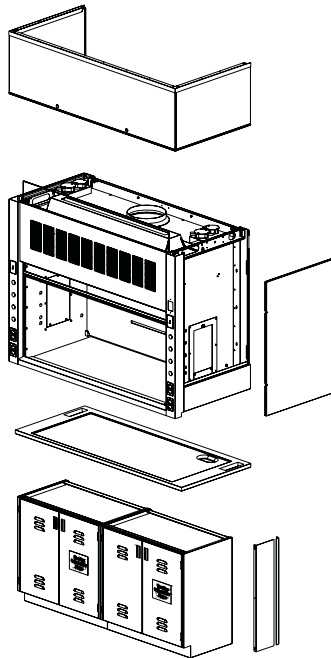
1. Pollution degree: 2
2. Installation category: II
3. Maximum altitude utilisation: 2000 meters
4. Humidity: 80% maximum for temperatures up to 31 degrees C decreasing linearly to 50% relative humidity at 40 degrees C.
5. Temperature: 5 to 40 degrees C
6. Main supply voltage fluctuations not to exceed  $\pm 10$  % of the nominal supply voltage.

## Installation Instructions

The Fume hood is delivered completely assembled but separate from the base cabinet and the counter top to be located under the hood (unless the counter top is integral to the inside lining).

### **Stages to follow:**

1. The end filler panels must be fixed, on each side, at the back of the cabinet.
2. The base cabinet must be level by the levelling devices under the base.
3. The counter top must be put in place and be fixed to the base cabinet.
4. You must remove the wrapping around the hood. You then have to align the hood to each side of the counter top.
5. If, as an option, a control system is provided, the control sub-contractor should do the connection.
6. You must put in place the cup sink (optional) by fixing it with a caulking joint.
7. If supplied with the hood (optional), you must installed the flexible conduit between the base cabinet back collar and one side of the hood at the back of the inside baffles.
8. It is important to make sure that the inside baffles are well in place.
9. If supplied, (optional), you must installed the furring panels between the hood and the ceiling as described on the panels.



## **Fume hood utilization**

1. The fluorescent lamp is activating by the light switch located on the left front fume hood post. This lamp, same as all the other electrical components, is located outside of the working area so away of the chemicals exhausted by the hood.
2. The electrical outlets located on the fume hood front posts are pre-wired to a junction box on top of the hood.
3. All plumbing fixtures for water, gas, air, vacuum or other services (optional), are supplied with the outlet inside the hood but with a remote controlled valve located on the fume hood front posts. The plumbing service can be done through the access panels located on each inside side of the hood or by removing the exterior side panels.

## **Maintenance directive**

1. All exterior surfaces can be cleaned, as required, with a wet rag or sponge using a solution of clear water and soap. Never use abrasive material or steel wool, it might scratch the finish.
2. The counter top can also be clean the same way. It is important to immediately wipe any chemical spillage and rinse the surface with clear water. To bring back original lustre, occasionally apply generously lemon oil with a gentle cloth and remove excess.
3. The inside baffles should be removed at least once a year to permit a good cleaning of the surface at the back of the baffles. It is important to put back the baffles before re-using the hood again.
4. The glass sash must be clean same as any glass surface.
5. A face velocity test should be performed at least once a year.