

SECTION 11612

BIOLOGICAL SAFETY CABINETS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Bench-mounted Class II, Type A biological safety cabinets.
- B. Bench-mounted Class II, Type A/B3 biological safety cabinets.

1.2 RELATED SECTIONS

- A. Section 11600 - Laboratory Equipment
- B. Section 12351 - Laboratory Casework
- C. Section 15400 - Plumbing Fixtures and Equipment
- D. Section 16200 - Electrical Power

1.3 REFERENCES

- A. CAN/CSA - C22.2 No. 1010.1.
- B. NSF International - Standard 49 for Biohazard Cabinetry.
- C. UL - Standard 3101-1.
- D. CE (European Community) - Electrical Safety Standard IEC 1010-1.
- E. CE (European Community) - Electromagnetic Compatibility Directive 89/336/EEC.
- F. _____.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's product data, including physical properties and application instructions.
- C. Shop Drawings: Prepared specifically for this project; show dimensions and interface with other products.
- D. Test Results: Ensure compliance with NSF 49.

1.5 QUALITY ASSURANCE

- A. Maintain testing facility at manufacturer's place of business for performance testing bench-mounted Class II, Type A and A/B3 safety cabinets.
- B. Safety cabinets wired for 115V/60Hz:
 - 1. Meet or exceed NSF Standard 49 minimum requirements and bear NSF Mark.
 - 2. Pass complete NSF biological challenge testing at downflow and inflow velocities of plus or minus 10 feet per minute (3.048 m/min) from manufacturer's nominal set point.
 - 3. Abridged or altered test methodology is unacceptable.
 - 4. Meet or exceed UL Standard 3101-1 and CAN/CSA C22.2 No. 1010.1 minimum requirements.
 - 5. Carry ETL Testing Laboratories seal.
 - 6. Carry ETL-C Testing Laboratories seal.
- C. Safety cabinets wired for 230V/50Hz:
 - 1. Conform to CE (European Community) requirements as tested by Inchcape Testing Services (UK) LTD: Electrical Safety Standard IEC 1010-1 and Electromagnetic Compatibility Directive 89/336/EEC.
- D. Make manufacturing facility, testing facility, and quality control procedures available for owner inspection.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver bench-mounted biological safety cabinets and accessories free of damage.
- B. Store and handle in a manner to prevent damage to biological safety cabinets, work surfaces, accessories, or adjacent work.

1.7 WARRANTY

- A. Warrant against defects in materials and workmanship on biological safety cabinets and accessories; include labor and replacement parts (except HEPA filters and lamps).
- B. Warranty Period: Two years from date of installation or three years from date of purchase, whichever is sooner.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Provide products made by Labconco Corporation, 8811 Prospect, Kansas City, MO 64132. ASD. Tel: (816) 333-8811 or (800) 821-5525. Fax: (816) 363-0130.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.
- C. Substitutions: Not permitted.
- D. Provide all biological safety cabinets from a single manufacturer.

2.2 MANUFACTURED UNITS

- A. Bench-Mounted Biological Safety Cabinets:
 - 1. 38-3/16 inches wide, 58-11/16 inches high, 30-1/4 inches deep (970 x 1490 x 768 mm).
 - 2. 50-3/16 inches wide, 58-11/16 inches high, 30-1/4 inches deep (1275 x 1490 x 768 mm).
 - 3. 74-3/16 inches wide, 58-11/16 inches high, 30-1/4 inches deep (1885 x 1490 x 768 mm).
 - 4. 115 volts, 60 Hz models.
 - 5. 230 volts, 50 Hz models.

2.3 MATERIALS

- A. Steel: Cold-rolled, 18 gage, epoxy coated.
- B. Stainless Steel: 16 gage, Type 304.
- C. Safety Glass: 3/8 inch (9 mm) tempered.

2.4 COMPONENTS

- A. HEPA Filters: Industry-standard size, 99.99 percent efficient on particles 0.000012 inch (0.3 micrometers) or larger, without requiring modification for installation.
- B. Fluorescent Lighting: 80-150 foot-candles (861-1615 lm/sq. m) on work surface.
- C. Motor: 1/3 horsepower (248.5 W), thermally protected, capacitor run type.

- D. Wiring Harnesses: Color coded, alphanumerically labeled for identification; removable wire tags shall not be used.
- E. Speed Control: Solid state, load rated for 25 amps.
 - 1. Hold motor within 1 volt of setting regardless of line voltage fluctuations above motor voltage setting.
 - 2. Start cabinet blower at full line voltage for approximately 1 second before controlling motor voltage at preset level.
- F. Electrical Duplexes with Splash Covers.
 - 1. Ground fault interrupters for certain models.
- G. Internal Ductwork: Epoxy coated steel permanently welded in place.
- H. Internal Balancing Damper: Sliding guillotine type.
- I. Drain Trough (beneath work tray): Equipped with 3/8 inch (9.5 mm) ball-type drain valve.
- J. Service Fixtures: Chrome-plated brass, quarter-turn, on-off style.
- K. Ultraviolet Light: Preheat style, type G30T8 or equivalent, 30 watt, 254 nanometer germicidal lamp.
- L. Unassembled Base Stand: Epoxy coated steel; include assembly instructions.

2.5 FABRICATION

- A. Design: True laminar (uniform) downflow as defined in NSF Standard 49.
 - 1. Nominal Downflow and Inflow:
 - a. 10 inch (250 mm) Work Access Opening: 80 feet per minute, plus or minus 5 feet per minute (24.38 m/min, plus or minus 1.52 m/min).
 - b. 8 inch (200 mm) Work Access Opening: 105 feet per minute, plus or minus 5 feet per minute (32.00 m/min, plus or minus 1.52 m/min).
 - 2. Supply and Exhaust HEPA Filters: Secure by spring-loaded clamps in upper cabinet assembly, compensating for gasket compression; removable from cabinet front.

3. Major Electronic Components (Speed Control, Ballasts, Starters, Switches, Motor Capacitors, Circuit Breakers): House in removable module for service or testing.
 4. Connections to Speed Control Wiring Harness: Key to prevent cross connections
 5. Differential Pressure Gage: Connect to negative pressure duct.
 6. Motor Mounting System: Permanent part of motor housing.
 7. Electrical Duplex Outlets: Activated from control panel area with their own circuit breaker.
 8. Power Cord: 8 feet (2.44 m) long, connect to cabinet by suitable keyed connector (IEC 320 AC inlet connector or equivalent). Permanently attached cords with strain relief connectors shall not be used.
 9. Motor/Blower, Lighting System, and Electrical Outlets: Controlled by separate switches with separate circuit breakers.
 10. Electrical Connection Box: Mount on rear panel, removable to allow passage through 30-inch (762 mm) wide doorway.
 11. Sound Level: 67 dbA or less when measured in accordance with NSF Standard 49.
- B. Liner Assembly; Sides, Rear, and Bottom: Welded construction, no silicone sealant or solder to seal surfaces.
- C. Upper Cabinet Assembly: Rolled steel without exposed bolts or screws. Construct so that positive pressure contaminated plenums are surrounded by negative pressure plenums. Design so that all major service operations can be performed from front of cabinet.
- D. Work Surface and Front Intake Grille: Single piece welded construction, radiused corners; removable without disconnecting fasteners.
- E. Sash: Pivoting type, with provisions to lock in operating, loading, or cleaning positions; positioning shall not require cables, counterweights, or springs.
1. Design so that inner and outer surfaces can be cleaned without disassembly.
 2. Removal not required for routine filter or motor/blower service.

- F. Electrical Duplex Outlets: Mount on back wall of stainless steel liner, one on each side.
- G. Cabinet shall accommodate up to 4 service fixtures.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify equipment rough-in before proceeding with work.
- B. Coordinate with other trades for proper installation of plumbing and electrical services and for rough opening dimensions required for hood installation.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions; comply with standards required by authorities having jurisdiction.
- B. Install equipment plumb, square, and straight, without distortion; securely anchor.
- C. Schedule installation to ensure that utility connections are achieved in an orderly and expeditious manner.

3.3 FIELD QUALITY CONTROL

- A. Qualified independent certifier shall certify biological safety cabinet before use, performing tests recommended in NSF International Standard No. 49.

3.4 ADJUSTING AND CLEANING

- A. Clean equipment, casework, countertops, and other surfaces as recommended by manufacturer, rendering work in new and unused appearance.
- B. Clean adjacent construction and surfaces soiled in the course of installation of this work.
- C. Touch up minor damaged surfaces caused by installation. Replace damaged components as directed by Architect.

3.5 PROTECTION

- A. Provide protective measures to prevent equipment and surfaces from exposure to other construction activity.

END OF SECTION