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| This guide specification was prepared utilizing 3-part format recommended by the Construction Specifications Institute (CSI), and generally incorporates recommendations from their SectionFormat™/Page Format™, and MasterFormat™, latest Editions, insofar as practicable.  Carefully review and edit the text to meet the Project requirements and coordinate this Section with the remainder of the Specifications and the Drawings.  Where bracketed text is indicated, e.g. [text], make appropriate selection and delete the remainder of text within additional brackets, highlighting, and bold face type, if any.  Consult the manufacturer for assistance in editing this guide specification for specific Project applications where necessary.  This Specification was current at the time of publication but is subject to change. Please confirm the accuracy of these specifications with the manufacturer prior to use. |

SECTION 11 53 13

LAS-3000 POLYPROPYLENE EXHAUSTED (VLAF) VERTICAL LAMINAR AIR FLOW HOOD

PART 1 GENERAL

1. SUMMARY
2. Section Includes:
   1. Non-Metallic Prefabricated LAS-3000 (VLAF) Hood
   2. Related accessories.
3. Junction box, switches, receptacles, and other controls.
4. Fixtures, Sinks or Accessories
   1. Demonstration and training in the use and maintenance of the hood.
5. RELATED REQUIREMENTS
6. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 11 Specification Sections, apply to this Section.
7. Division 12 Manufactured Plastic Casework
8. Division 15 Mechanical
9. Division 26 Electrical
10. REFERENCES
11. American National Standards Institute/American Industrial Hygiene Association (ANSI/AIHA)
12. ASTM International (ASTM)
    1. ASTM D570-98(2010) e1, Standard Test Method for Water Absorption of Plastics
    2. ASTM D638-10, Standard Test Method for Tensile properties of Plastics
    3. ASTM D695-10, Standard Test Method for Compressive Properties of Rigid Plastics
    4. ASTM D790-10, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics
13. ANSI / ASHRAE Standard 110-1995 Fume Hood Testing
14. The Scientific Equipment and Furniture Association (SEFA)
15. Federal Standard 209E ~ Class 100 Air Quality
16. NSF #49
17. ACTION AND INFORMATIONAL SUBMITTALS
18. Submit in accordance with Division 11
    1. Product Data: For each product indicated, submit technical data. Include the following:
19. Manufacturer's model number.
20. Detailed specifications of construction.
21. Accessories and components that will be included for Project.
    1. Shop Drawings: Include plans, elevations, and sections with dimensions, description of materials and finishes, general construction roughing‑in dimensions, component connections, anchorage methods, hardware, utility service requirements, and attachments to other work.
22. Indicate clearance requirements for access and maintenance.
23. Indicate utility service connections for water, drainage, and power; include roughing‑in dimensions.
    1. Samples:
24. Not less than 4" square piece of polypropylene stock used in the general construction of the clean bench, in thickness and finish specified, if requested by the Architect.
25. Not less than 4" square piece of work surface material, in thickness, color.
26. SOURCE QUALITY ASSURANCE
27. Compliance:
    1. Comply with the provisions of the Building Code, these specifications, and standards referenced in Article 1.03 REFERENCES.
28. Manufacturer: A firm with undivided responsibility for the fabrication of clean benches, performed at a single location, and with minimal exposure to outside contaminants.
29. Factory Tests: Prior to shipping, each VLAF Hood to be tested to the manufacturer’s specification to verify the hoods performance meet the Personnel and Product Protection safety factor. A copy of this test report to accompany each hood shipped.
30. Field Testing: Each hood to have field certification to manufacturer’s specifications after hood is installed and all exhaust / supply systems fully operational and balanced. The field test to be performed by an independent certifying agency at no additional expense to Owner.
31. Hood certification should be done yearly to assure the hood is operating safely.
32. Training: After the VLAF Hood has been accepted and fully operational, the manufacturer or his representative should coordinate with the Owner for training of proper hood operation and maintenance or adjustments of hood, at no additional expense to Owner.
33. DELIVERY, STORAGE, AND HANDLING
34. Deliver, store, and handle the hood using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
    1. Deliver hood to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
    2. Inspect hood on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
    3. The **Construction Manager** will provide a secure location and enclosure at project site for storage of hood until time of installation.
35. FIELD CONDITIONS
36. Environmental Requirements:
    1. Do not install hood until building is enclosed, and surrounding construction is completed including overhead work associated with the hood, floor, wall and ceiling finishes, mechanical, electrical, plumbing, and fire protection work performed by others.
37. WARRANTY
38. Warranty Period: One year from the date of customer acceptance or substantial completion, whichever is later. Stipulate that defects that develop within the Warranty period shall be removed, repaired or replaced at no additional cost to owner.
    1. Failures include, but are not limited to:
39. Manufacturer defects;
40. Structural failure;
41. Warping, and;
42. Finish.
    1. Failures do not include:
43. Damages caused by misuse, abuse, or modifications made by the Owner

SPECIFIER Select: When warranties are required, verify with Owner's counsel that warranties stated in this Article are not less than remedies available to Owner under prevailing local laws.

PART 2 PRODUCTS

1. MANUFACTURER
2. Acceptable Manufacturers:

LabAire Systems (LAS), a Division of Activar Plastics Products Group

9650 Newton Avenue South

Bloomington, Minnesota 55431

1. Substitutions: Manufacturers seeking approval of their products are required to comply with the Owner's Instructions to Bidders and must meet product specification and performance characteristics specified herein.
   1. For manufacturers or suppliers not listed, submittal for approval must be received by the Architect / Lab Planner at least 10 calendar days prior to bid date. No exceptions.
2. MANUFACTURED UNITS
3. VLAF Fume Hood: Model LAS-3000
4. External Hood Widths:
   1. Widths: 3ft. / 4ft. / 5ft. / 6ft. / 8ft.
5. Two Work Surface Depths:
   1. 24” Inside Work Surface Depth with an External Hood Depth 30”
   2. 30” Inside Work Surface Depth with an External Hood Depth 36”
   3. 27” Internal Height with an External Height 57.50”
6. Electrical Requirements:
   1. Motorized Impeller (accessible from hood front) is 110V / 60Hz power
   2. Motorized Impeller (accessible from hood front) is 220V / 50 Hz power
   3. Optional Duplex Outlet (15A / 20A) with or without GFCI
7. PERFORMANCE CRITERIA
8. General Performance Requirements: Properly installed fume hood serves as a Class 100 (ISO 5) clean air application, thus giving the operator “Personnel and Product Protection”.
   1. For a design point the fume hood has room air drawn into a HEPA filter via an internal supply impeller, pushed thru the HEPA filter and plastic diffuser down into the work zone.
   2. The supply Downflow blower shall be a plastic backward inclined motorized impeller and rated for 24-hour continuous operation.
   3. The Class B insulated motor shall be thermally protected, and speed controlled by a solid state, voltage regulated speed controller.
   4. The perforated work surface is removable and sits above a leak tight exhaust plenum that will drain to either an optional sink drain or to a ball valve.
   5. The average Inflow airflow velocity is 100 LFPM with an 8” to 12” operating access opening.
   6. The average Downflow air velocity is between 55 and 65 LFPM +/– 20% average
   7. The table below shows the exhaust volumes and negative static pressure required for each hood. Table is based on an average Inflow of 100 LFPM and Downflow average of 60 LFPM @ 10” sash opening.

Hood Width 24” Work Surface Depth 30” Work Surface Depth

3’ Hood 457 CFM @ 0.6 Static Pressure 553 CFM @ 0.6 Static Pressure

4’ Hood 668 CFM @ 0.8 Static Pressure 759 CFM @ 0.8 Static Pressure

5’ Hood 878 CFM @ 0.8 Static Pressure 998 CFM @ 0.8 Static Pressure

6’ Hood 1090 CFM @ 0.8 Static Pressure 1238 CFM @ 0.8 Static Pressure

8’ Hood 1511 CFM @ 1.5 Static Pressure 1794 CFM @ 1.5 Static Pressure

1. Illumination within the Work Area:
   1. Definition of Work Area: The area from the work surface to the underside of the diffuser, which is 27” and the width from inner side wall to inner side wall, and the depth from the inside face of the sash to the inside of back wall.
   2. The lighting will be an externally mounted Polypropylene fixture holding the lamps. The average illumination level within the work area shall be 90 to 120-foot candles.
2. (2) Tube LED lights
3. UL Listed junction box and wiring
4. Lights and Blower switch with on-off positions
   1. All electronic controls will be housed in a sealed Polypropylene enclosure, accessible from hood top.
   2. the work space will be enclosed each side by 4” wide side walls forming the plumbing chase, which will be accessible from access panels inside each interior wall and each exterior wall.
5. MATERIALS
6. Materials:
   1. Hood: Standard Polypropylene or Flame Retardant in color of Glossy White.
7. Physical Characteristics: Refer to manufacturer's chart if required.
   1. Work Surface:
8. Perforated Polypropylene Only
   1. Filters:
9. Class 100 (ISO 5) HEPA Filter media to have a minimum of 99.99% efficient on 0.3-micron particles. Filter is accessible from hood front.
10. Pre-Filter is a disposable non-woven fiberglass media and is accessible from hood top
11. Plastic Diffuser over HEPA Filter
12. Class 10 (ISO 4) Option to have filter supplied with a minimum of 99.999% efficient on 0.12-micron particles
13. Option to have Boron Free filter
    1. Fasteners: Manufacturer's standard recommended fasteners.
14. Polypropylene screws.
    1. Adhesives / RTV / Sealants: 100 percent silicone.
15. CONTROLS
16. Standard Operation Controls:
    1. Impeller Speed Control
    2. Optional Digital Manometer
17. Measures total exhaust static pressure
    1. Optional Minihelic gauge
18. Measures filter load
19. OPTIONAL ACCESSORIES
20. VLAF Hood Base / Stand
    1. Vented Polypropylene Base Cabinet
    2. Polypropylene Stand
    3. Epoxy Painted Metallic Stand
21. Sinks:
    1. Molded Cup Sinks
    2. Fabricated Sinks
    3. Custom / ADA Sized Sinks
22. Faucets:
    1. Molded Faucets
    2. Fabricated or Custom Faucets
    3. Faucets with Standard or Atmospheric Vacuum Breakers
23. Plastic Turrets / Petcocks:
    1. Vacuum
    2. Nitrogen
    3. Gas
    4. Lab Water / RO / DI Water
24. Faucet Handles:
    1. Standard Premanufactured or ADA Levers
    2. Fabricated Handles
25. FABRICATION
26. General: The main assembly is constructed of 1/2-inch thick, white Polypropylene. Seams are fully seam-welded using hot air or nitrogen, forming the rigid structure. Where required each fume hood can be supplied with a base cabinet or stand in Polypropylene or a Metallic Construction.
27. Joints: Joints are formed with 5/32-inch white Polypropylene welding rod.
    1. Joints are water tight.
    2. Exterior welds are shaved flush with construction material to create a uniform surface.
28. Work Surface: The ¼” perforated work surface has a ribbed structure on the underside to add structural rigidity
29. Electrical features are all UL-listed wiring, flexible conduit and junction boxes. Junction boxes are sealed using gaskets.
30. Closure Panels:
    1. Provide optional Polypropylene ceiling / rear plumbing closure panels if required.
31. SOURCE QUALITY ASSURANCE
32. Factory Tests: Prior to shipping, each VLAF Hood to be tested to the manufacturer’s specification to verify the hoods performance meet the Personnel and Product Protection safety factor. Clean Hoods are tested to comply with USA Federal Standard 209E / ISO 1-144641 / ISO-9001; 2008 by independent third-party testing prior to shipping; results are available to the Owner, if requested.
33. Field Testing: Each hood to have field certification to manufacturer’s specifications after hood is installed and all exhaust / supply systems fully operational and balanced. The field test to be performed by an independent certifying agency and at no additional expense to Owner.
    1. Hood certification should be done yearly to assure the hood is operating safely.
34. Training: After the VLAF Hood has been accepted and fully operational, the manufacturer or his representative should coordinate with the Owner for training of proper hood operation and maintenance or adjustments of hood, at no additional expense to Owner.

PART 3 EXECUTION

1. EXAMINATION
2. Examine substrates, areas, and conditions, with installer present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Notify the Construction Manager of conditions detrimental to performance of the work and recommended corrections. Where the installation and its completion will be delayed due to existing conditions, follow notification immediately with a written report. Proceed with installation only after unsatisfactory conditions have been corrected.
3. INSTALLATION
4. General: Install fume hood in strict accordance with the manufacturer's instructions, plumb, level, aligned, rigid, and securely anchored to supporting casework, in proper location, and in accordance with final shop drawings.
5. Coordinate sequence of work with mechanical, plumbing, and electrical trades and with installation of related casework.
6. CLEANING AND PROTECTION
7. Clean units following installation in accordance with manufacturer's instructions and recommendations using liquids that will not harm finishes and glazing.
   1. Clean all surfaces of the unit.
8. Advise **Construction Manager** of methods to protect VLAF hood until acceptance by the Owner. Protect fume hood from damage due to other construction activity, during installation and after acceptance.
9. Close OUT SUBMITTALS
10. Demonstration and Training: Engage a factory‑authorized service representative to train Owner's personnel to adjust, operate, and maintain (VLAF) Hood.
    1. Perform training only after equipment has been installed, tested, and is operating correctly.
    2. O & M: Supply copy of Owners Maintenance Manual
    3. Warranty: Supply (2) copies for inclusion in the Owners and Maintenance Manual
    4. Supply cleaning information for all materials used in fabrication.
    5. Supply part numbers for replaceable equipment, such as filters, handles, hinges and screws.

END OF SECTION