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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-2000 POLYPROPYLENE (HLAF) HORIZONTAL LAMINAR AIRFLOW CLEAN BENCH

PART 1 - GENERAL

1. SUMMARY
2. Section Includes:
   1. Non-Metallic Prefabricated LAS-2000 (HLAF) Clean Bench
   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 clean bench.
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. The Scientific Equipment and Furniture Association (SEFA)
14. Federal Standard 209E ~ Class 100 Air Quality
15. ACTION AND INFORMATIONAL SUBMITTALS
16. Submit in accordance with Division 11
    1. Product Data: For each product indicated, submit technical data. Include the following:
17. Manufacturer's model number.
18. Detailed specifications of construction.
19. 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.
20. Indicate clearance requirements for access and maintenance.
21. Indicate utility service connections for water, drainage, and power; include roughing‑in dimensions.
    1. Samples:
22. 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.
23. Not less than 4" square piece of work surface material, in thickness, color, and finish specified.
24. SOURCE QUALITY ASSURANCE
25. Compliance:
    1. Comply with the provisions of the Building Code, these specifications, and standards referenced in Article 1.03 REFERENCES.
26. Manufacturer: A firm with undivided responsibility for the fabrication of clean benches, performed at a single location, and with minimal exposure to outside contaminants.
27. Factory Tests: Prior to shipping, each (HLAF) clean bench to be tested to the manufacturer’s specification to verify the clean bench performance meet the Product Protection safety factor.   
    A copy of this test report to accompany each clean bench shipped.
28. Field Testing: Each clean bench to have field certification to manufacturer’s specifications after clean bench is installed and all supply system is fully operational and balanced. The field test to be performed by an independent certifying agency at no additional expense to Owner.
    1. Clean Bench certification should be done yearly to assure the hood is operating safely.
29. Training: After the (HLAF) clean bench has been accepted and fully operational, the manufacturer or his representative should coordinate with the Owner for training of proper clean bench operation and maintenance or adjustments of clean bench, at no additional expense to Owner.
30. DELIVERY, STORAGE, AND HANDLING
31. Deliver, store, and handle clean benches using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
    1. Deliver clean bench 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 clean bench 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 clean bench until time of installation.
32. FIELD CONDITIONS
33. Environmental Requirements:
    1. Do not install clean bench until building is enclosed, and surrounding construction is completed including overhead work associated with the clean bench, floor, wall and ceiling finishes, mechanical, electrical, plumbing, and fire protection work performed by others.
34. WARRANTY
35. 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:
36. Manufacturer defects;
37. Structural failure;
38. Warping, and;
39. Finish.
    1. Failures do not include:
40. Damages caused by misuse, abuse, or modifications made by the Owner

PART 2 - PRODUCTS

1. ACCEPTABLE MANUFACTURERS
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. Clean Bench: Model LAS-2000
4. External Bench Widths:
   1. Widths: 3ft. / 4ft. / 5ft. / 6ft. / 8ft.
5. Two Work Surface Depths:
   1. 24.00” Inside Work Surface Depth with an External Bench Depth 30”
   2. 30.00” Inside Work Surface Depth with an External Bench Depth 36”
6. Electrical Requirements:
   1. Motorized Impeller (accessible from bench front) is 110V / 60Hz power
   2. Motorized Impeller (accessible from bench 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 operating clean bench serves as a Class 100 (ISO 5) clean air application, thus giving the operator “Product Protection”.
   1. For a design point the clean bench has room air drawn into a HEPA filter via an internal supply impeller, pushed thru the HEPA filter and plastic diffuser into the work zone. The clean bench has an average airflow velocity over the work surface at 90 LFPM +/- 20%.
9. Illumination within the Work Area:
   1. Definition of Work Area: The area from the work surface to the maximum opening height of the bench and the width from inner side wall to inner side wall, and the depth from the outside face of the bench to the inside of back wall.
   2. The average illumination level within the work area shall be 90 to 120 foot candles.
10. MATERIALS
11. Materials:
    1. Bench: Standard Polypropylene or Flame Retardant Polypropylene
12. Physical Characteristics: Refer to manufacturer's chart if required
    1. Work Surfaces:
13. Polypropylene, Stainless Steel, Phenolic Resin or Epoxy Resin
    1. Adhesives / RTV / Sealants: 100 percent silicone.
    2. Fasteners: Manufacturer's standard recommended fasteners.
14. Polypropylene screws.
    1. Lighting:
15. Strip LED lighting
16. UL Listed junction box and wiring
17. Electrical and Blower switch with on-off positions
    1. Filter:
18. (HEPA) Filter media to have a minimum of 99.99% efficient on 0.3 micron particles
19. Pre-Filter is a disposable non-woven fiberglass media
20. Plastic Diffuser over HEPA Filter
21. Option to have (ULPA) filter supplied with a minimum of 99.999% efficient on 0.12 micron particles
22. Option to have Boron Free filter
23. CONTROLS
24. Standard Operation Controls:
    1. Minihelic Gauge
25. Measures filter load.
26. OPTIONAL ACCESSORIES
27. HLAF Base / Stand
    1. Polypropylene Base Cabinet
    2. Polypropylene Stand
    3. Epoxy Painted Metallic Stand
28. Sinks:
    1. Molded Cup Sinks
    2. Fabricated Sinks
    3. Custom / ADA Sized Sinks
29. Faucets:
    1. Molded Faucets
    2. Fabricated or Custom Faucets
    3. Faucets with Standard or Atmospheric Vacuum Breakers
30. Plastic Turrets / Petcocks:
    1. Vacuum
    2. Nitrogen
    3. Gas
    4. Lab Water / RO / DI Water
31. Faucet Handles:
    1. Standard Premanufactured or ADA Levers
    2. Fabricated Handles
32. FABRICATION
33. 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.
34. Joints: Joints are formed with 5/32-inch white Polypropylene welding rod.
    1. Joints are watertight.
    2. Exterior welds are shaved flush with construction material to create a uniform surface.
35. Work Surface: The surface has a ribbed structure on the underside to add structural rigidity.
36. Electrical features are all UL-listed wiring, flexible conduit and junction boxes. Junction boxes are sealed using gaskets.
37. Closure Panels:
    1. Provide optional Polypropylene ceiling / rear plumbing closure panels if required.
38. SOURCE QUALITY ASSURANCE
39. Factory Tests: Clean Benches are tested for Product Protection, at the manufacturer's assembly facility in compliance 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.
40. Field Testing: Each bench to have field certification to manufacturer’s specifications after bench is installed. The field test to be performed by an independent certifying agency and at no additional expense to Owner.
    1. Clean Bench certification should be done yearly to assure the bench is operating safely.
41. Training: After the Clean Bench has been accepted and fully operational, the manufacturer or his representative should coordinate with the Owner for training of proper clean bench operation and maintenance or adjustments of bench, 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 clean bench 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 HLAF clean bench until acceptance by the Owner. Protect clean bench from damage due to other construction activity, during installation and after acceptance.
9. CLOSEOUT SUBMITTALS
10. Demonstration and Training: Engage a factory‑authorized service representative to train Owner's personnel to adjust, operate, and maintain clean bench.
    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