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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

PRODUCT TYPE

PART 1 - GENERAL

1. SUMMARY
2. Section Includes:
   1. Prefabricated chemical fume hood.

*SPECIFIER: Revise subparagraphs below to suit Project requirements.*

* 1. Related accessories
     1. Junction Boxes, Switches, Receptacles, and Other Controls
     2. Fixture, Sinks or Accessories
     3. Work Surfaces
     4. Fume hood base
     5. Filler panels and ceiling enclosures
  2. Demonstration and training in the use and maintenance of the fume hoods.

1. Related Requirements:

*SPECIFIER: Revise section numbers and titles in subparagraphs below per CSI MasterFormat and Project requirements.*

* 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 11 Specification Sections, apply to this Section

*SPECIFIER: Delete Section 01 21 00 - Allowances if locations are clearly shown on the Drawings and sizes are either indicated alongside the locations or specified herein.*

* 1. Section 01 21 00 – Allowances: For cash or quantity allowances covering access panels and frames.
  2. Division 01 33 00 – Submittal Procedures: For administrative and procedural requirements for processing of submittals during the construction phase.
  3. Division 01 77 00 – Closeout Procedures: For administrative and procedural requirements for completion of the Work.

*SPECIFIER: Retain subparagraph below to suit Project requirements; revise section number and title per project requirements.*

* 1. Division 12 35 00 Manufactured Plastic Casework
  2. Division 22 Plumbing: Furnishing and installation of plumbing utilities and final connections.
  3. Division 23 Heating, Ventilating and Air Conditioning: Furnishing and installation of exhaust duct work and equipment and final connections to fume hoods.
  4. Division 26 Electrical: Furnishing and installation of electrical utilities and final connections.

1. References
2. American National Standards Institute/American Industrial Hygiene Association (ANSI/AIHA)
   1. ANSI/AIHA Z9.5 – 2003, Laboratory Ventilation
3. American National Standards Institute/American Society of Heating, Refrigeration, and Air Conditioning Engineers (ANSI/ASHRAE)
   1. ANSI/ASHRAE Standard 110 – 2016, Method of Testing Performance of Laboratory Fume Hoods
4. American National Standards Institute/International Organization for Standardization/American Society for Quality Control (ANSI/ISO/ASQC)
   1. ANSI/ISO/ASQC Q9001:2015
5. ASTM International
   1. ASTM C1048-04, Standard Specification for Heat-Treated Glass—Kind HS, Kind FT Coated and Uncoated Glass
   2. ASTM C1172-09 e1, Standard for Laminated Architectural Flat Glass
   3. ASTM D570-98 (2010) e1, Standard Test Methods for Water Absorption of Plastics
   4. ASTM D638-10, Standard Test Methods for Tensile Properties of Plastics
   5. ASTM D695-10, Standard Test Methods for Compressive Properties of Rigid Plastics
   6. ASTM D790-10, Standard Testing Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
   7. ASTM D4101-10a, Stand Specification for Polypropylene Injection and Extrusion Materials
   8. ASTM E162-09, Standard Method for Flammability of Materials Using a Radiant Heat Source
6. The Scientific Equipment and Furniture Association (SEFA)
   1. SEFA 1-2010, Recommended Practices for Laboratory Fume Hoods
   2. SEFA 2-2010, Recommended Practices for Laboratory Installation
   3. SEFA 3-2010, Recommended Practices for Laboratory Works Surfaces
   4. SEFA 7-2010, Recommended Practices for Fixtures
   5. SEFA 8PL-2016, Recommended Practices for Laboratory Grade Polypropylene Casework
   6. SEFA 10-2013, Recommended Practices for Laboratory Adaptable Casework Systems
   7. SEFA 11-2013, Recommended Practices for Liquid Chemical Storage

*SPECIFIER: Delete subparagraph below if no fire-rated fume hoods are specified.*

1. Underwriters Laboratories, Inc. (UL)
   1. UL 1805, Standards for Laboratory Hood and Cabinets
2. US Consumer Product Safety Commission (CPSC)
   1. 16 CFR Part 1201 (1-1-05 Edition) Safety Standards for Architectural Glazing Materials
3. Canadian Standards Associations (CAN/CSA)
   1. CANS/CSA C22.2 No. 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use
4. Action Informaiton and Submittals
5. Submit in accordance with Division 11
   1. Product Data: For each product indicated, submit technical data. Including the following:
      1. Manufacturer model number.
      2. Detailed specifications of construction.
      3. Accessories and components that will be included for Project.
   2. Shop Drawings: Include plans, elevations, and sections with dimensions, description of materials and finishes, general construction rough-in dimensions, component connections, anchorage methods, hardware, utility service requirements, and attachments to other work.
      1. Include layout of units with relation to surrounding walls, doors, windows, lighting and air conditioning fixtures, connections of hood to hood exhaust system, location of access doors, and junction boxes.
      2. Indicate clearance requirements for access and maintenance.
      3. Indicate utility service connections for water, drainage, and power: include roughing-in dimensions.
      4. Coordinate shop drawings with other trades whose work affects installation or performance of fume hoods.
   3. Samples:
      1. Not less than 4” square piece of polypropylene stock used in the general construction of the fume hood, in thickness and finish specified, if requested by the architect.
      2. Not less than 4” square piece of work surface material, in thickness, color, and finish specified.
   4. Test and Evaluation Reports: Submit results of testing required under articles 2.09 SOURCE QUALITY CONTROL and 3.03 FIELD QUALITY CONTROL
   5. Qualification Statements: Written statement from fume hood manufacturer, the installer meets requirements specified in Article 1.06 Quality Assurance.
6. Closeout submittals
7. Submit in accordance with Section
   1. Operation and Maintenance Data: Include detailed instructions for use and maintenance of fume hoods.
   2. Warranty: Submit (2) copies for inclusion in the Owner’s systems and equipment maintenance manual.
   3. Supply cleaning information for different materials used.
   4. Supply part numbers of replaceable equipment, such as handles, hinges and screws.
8. Quality Assurance
9. Compliance:
   1. Comply with the provisions of the Building Code, these specifications, and standards referenced in Article 1.03 REFERENCES, except where more stringent requirements are shown on the Drawings or specified herein.
   2. Fume hoods and their installations shall comply with laws, ordinances, rules, regulations and orders of governing authorities having jurisdiction over this portion of the Work.
10. Manufacturer: A firm with undivided responsibility for the fabrication of fume hoods, performance at a single location, and with minimal exposure to outside contaminants.
11. Installer: The manufacturer or an installer authorized by the manufacturer to install laboratory equipment with at least 10 years of successful experience in installing fume hoods similar to those specified.
12. Delivery, storage, and handling
13. Deliver, store and handle fume hoods using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer’s written instructions.
    1. Deliver fume hoods to Project site in undamaged condition in manufacturer’s original sealed containers or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
    2. Inspect fume hoods 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 fume hoods until time of installation.
14. Field Conditions
15. Environmental Requirements:
    1. Do not install fume hoods until building is enclosed, and surrounding construction is completed including overhead work associated with the fume hoods, floor, wall and ceiling finishes, mechanical, electrical, plumbing and fire protection work performed by others.
16. Warranty
17. 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:
       1. Manufacturer defects
       2. Structural failure
       3. Warping
       4. Finish

PART 2 - PRODUCTS

1. Fume Hood
2. Acceptable Manufacturers:

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

9650 Newton Avenue South

Bloomington, MN 55431

(877)410-4910

(952)392-3915

(952)400-2705 (FAX)

[www.labairesystems.com](http://www.labairesystems.com)

[info@labairesystems.com](mailto:info@labairesystems.com)

1. Substitutions: Manufacturers seeking approval for their products are required to comply with the Owner’s Instructions to Bidders, generally contained in the Project Manual.
2. Manufactured units
3. Fume Hood: Model LAS-1000 Rust Free Polypropylene Fume Hood
4. External Hood Widths:

*SPECIFIER: Delete Model Not Required*

* 1. 3-foot Hood, 319 CFM @ 18” opening, Static Exhaust: 0.2” W.G.
  2. 4-foot Hood, 469 CFM @ 18” opening, Static Exhaust: 0.3” W.G.
  3. 5-foot Hood, 619 CFM @ 18” opening, Static Exhaust: 0.4” W.G.
  4. 6-foot Hood, 769 CFM @ 18” opening, Static Exhaust: 0.5” W.G.
  5. 8-foot Hood, 1069 CFM @18” opening, Static Exhaust: 0.8” W.G.

1. Work Surface
   1. Depth:
      1. 24” Inside Work Surface Depth with an External Hood Depth 30”
      2. 30” Inside Work Surface Depth with an External Hood Depth 36”
2. Performance Criteria
3. General Performance Requirements: Properly installed and operating fume hoods serve as ventilated workspaces, with the purpose of capturing, containing, and evacuating fumes, vapors and other airborne particulates associated with the activity within the enclosure. For a design point the Fume Hood has an average inflow velocity through the work surface opening at 100 FPM.
4. Illumination within the Work Area:
   1. Definition of Work Area: The area from the work surface to the maximum opening height of the front sash to the front face of the baffles.
   2. The average illumination level within the work area shall be 90 to 120-foot candles
5. Air Flow: Proper Design shall allow for safe and consistent air flow inside the hood and around the hood face.
   1. The fume hood is designed to work within a Variable or Constant Air Volume System.
      1. The system shall maintain a safe face velocity based on the recommendations of the manufacturer.
   2. Variations in air flow shall not exceed manufacturer’s in-house test results when tested in accordance with ANSI/ASHRAE 110.
6. Static Air Pressure Loss:
   1. The design of the fume hood shall allow for minimal static pressure loss.
   2. The maximum average static pressure loss reading shall be taken 3 diameters above the fume hood outlet, from 4 points, 90 degrees apart, and shall not exceed the guidelines in full, open position.
7. Materials
8. Hood: Refer to manufacturer’s chart for physical characteristics.
   1. Standard Polypropylene.

*SPECIFIER: Select specific option listed below at additional cost*

* 1. FM 4910 Flame Retardant Polypropylene
  2. UL 94V0 Flame Retardant Polypropylene

1. Work Surface:
   1. Polypropylene

*SPECIFIER: Select specific option listed below at additional cost*

* 1. FM4910 Polypropylene
  2. Epoxy
  3. Phenolic

1. Sash Material:
   1. Clear Polycarbonate (Tuffak) 6mm (1/4” Nominal)

*SPECIFIER: Select specific option listed below at additional cost*

* 1. Clear PVC (Polyvinylchloride) 6mm (1/4” Nominal)

1. Sash Counterweight Connection: Kevlar-reinforced polyurethane belt.
2. Adhesives/RTV/Sealants: 100 percent silicone.
3. Fasteners: Manufacturer’s standard recommended fasteners.
   1. Polypropylene screws.
   2. PTFE coated Stainless Steel screws (used outside work zone).
   3. Steel shoulder bolts (used outside work zone, in chase area).
4. Lighting
   1. (2) Tube LED lights

*SPECIFIER: Select specific option listed below at additional cost*

* 1. Non-UV Amber LED lights: Filter all wavelengths below 520nm.

1. Controls
2. Sash Control
   1. Manual raising and lowering.
   2. Manual sash stop at 18”

*SPECIFIER: Select specific option listed below at additional cost*

* 1. Encoded, motor driven sash, adjustable settings including speed, location, and presets.

1. Lighting
   1. Electrical On/Off rocker switch.
2. Rear Baffle: Stationary and constructed of the same material of the work zone.

*SPECIFIER: Select specific option listed below at additional cost*

1. Air Flow Monitor and Control
   1. Face velocity monitor control
   2. Auto motion sensor control
   3. Sash positioning sensor
2. Fixtures
3. Sinks:
   1. Molded Cup Sink

*SPECIFIER: Select specific option listed below at additional cost*

* 1. Fabricated sink
  2. Custom/ADA sink

1. Faucets:
   1. Extruded Natural Polypropylene body material
   2. No elastomer, metal and lubricant used in construction.
   3. PTFE Seals.
   4. Deck mount or wall mount available (subject to location).
   5. Max flow rate of 2.5 GPM @ 80 PSI.

Operating pressure range: 1-200 PSI.

*SPECIFIER: Select specific option listed below at additional cost*

* 1. PVC material.
  2. PVDF material.
  3. Standard Vacuum or Atmospheric Vacuum Breaker.
  4. Hot/Cold Mixing.
  5. ADA Blade Handles.
  6. Replaceable 0.2 Micron capsule filter.

1. Service Fixtures: Color-coded hose nozzle outlets mounted inside the fume hood and controlled from the exterior with color coded index handles for up to 8 fixtures.
   1. Service lines shall be installed from valve to outlet.
   2. Connections shall be made with using Polypropylene compression fitting and Polyethylene tubing. Polypropylene compression fitting ½” MPT and 6ft of tubing will be provided for incoming services.
   3. Brass service lines will be used for gas.
      1. Valves
         1. Air
         2. Vacuum
         3. Nitrogen
         4. Deionized/Distilled water
         5. Hot and/or cold water
2. Accessories

*SPECIFIER: Select specific option listed below at additional cost*

1. Ceiling enclosure panels: Filler panels matching fume hood exterior to enclose space above fume hoods at front and sides of fume hoods and extending from tops of fume hoods to ceiling. Fasteners will be of PTFE coated stainless steel.
   1. 8ft ceiling height
   2. 10ft ceiling height
   3. Custom height
2. Vent kit
   1. Ridged PVC
   2. High/Low flexible kit
   3. Double acid flexible kit
3. PTFE DI/N2 spray Gun with 8ft of flexible tubing.
   1. Deck Mount
   2. Wall Mount
4. PTFE handheld eye wash gun with 8 ft of flexible tubing
   1. Deck Mount
   2. Wall Mount
5. Emergency off Button
6. Fume Hood Equipment Lattice Kit: All components are constructed of fiberglass and thread into receptacles in baffle.
7. Exhaust duct wash down with drain trough
8. Exhaust damper with quadrant lock.
   1. 8” diameter
   2. 10” diameter
   3. 12” diameter
9. Fabrication
10. General: The main assembly is constructed of ½-inch thick, white Polypropylene. Seams are fully seam-welded using hot air or nitrogen, forming the rigid internal structure, with removable, white Polypropylene access panels to enclose utilities and inner components. Panels are size differently to accommodate ease of use and function. Standard overall dimensional tolerances are plus-or-minus 1/8-inch. Where required each hood can be supplied with a Fume Hood base either in Polypropylene or Metallic Construction
11. 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.
12. Structure: The unit is constructed with the inner walls as the main support structure. Walls contain access ports to the utility areas, which are secured with ¼-20 white Polypropylene Philips head screws. Ports are flush with the surrounding walls with lipped construction to reduce the potential of leakage. External walls are removable and secured with ¼-20 PTFE coated Stainless Steel Philips head machine screws.
13. Airfoil: The airfoil is constructed from 3/8-inch white Polypropylene with additional bracing and mounting brackets spaced along the length of it. The airfoil rests on the lip of the spill retention trough. The airfoil is removable for easy cleanup.
14. Work Surface: The Hood work surface is dished for spill retention. The surface has a ribbed structure on the underside to add structural rigidity.
15. Viewing Panel and Sash: The front viewing panel is glazed with clear Polycarbonate. The frame supporting the sash is made of white Polypropylene and contains a ballast area. The sash will be attached with Kevlar-reinforced Polyurethane belt. The pulleys are made from Polypropylene. The handle is constructed of white Polypropylene.
16. Baffles: The baffles are rectangular-shaped. Four layers of evenly spaced slots pull the workspace air into the rear exhaust plenum.
17. Electrical features are contained in UL listed PVC junction boxes and connected by PVC pipe. Junction boxes are sealed using gaskets.
18. Source Quality Controls
19. Tests: Fume hoods are tested at the manufacturer’s assembly facility in compliance with ANSI/ASHRAE 110 (Manufacturer’s Test), by independent third-party testing prior to shipping; results are available to the Owner, if requested.
    1. These tests generally include:
       1. Tracer Gas Test
       2. Face Velocity Test
       3. Smoke Pattern Test
       4. Saturation Smoke Test

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 immediately with a written report. Proceed with installation only after unsatisfactory conditions have been resolved.
3. Installation
4. General: Install fume hoods in strict accordance with manufacturer instructions, plumb, level, aligned, rigid, and securely anchored to supporting casework, in accordance with final shop drawings.
5. Coordinate sequence of work with mechanical, plumbing, and electrical trades and with installation of related casework.
6. Field Quality Control
7. Acceptance Testing: On completion of fume hood installation and before permitting regular use, perform acceptance tests in accordance with ANSI/ASHRAE 110, for face velocity and airflow smoke patterns.
   1. Advise Owner and Architect in advance of dates and times that tests are to be performed on fume hoods.
   2. Fume hoods are determined to have passed testing if test results meet performance criteria specified.
   3. Fume hoods which fail to comply with scheduled tests shall be adjusted in the field by the appropriate mechanical trades and retested until compliance with specified limits of operation are obtained.
8. Cleaning and protection
9. Clean fume hoods following installation in accordance with manufacturer instruction and recommendations using liquids that will not harm finishes and glazing.
   1. Clean exposed surfaces of the fume hood including surfaces exposed to view, those within the work area, and glazing.
10. Advise Construction Manager of methods to protect fume hoods until acceptance by the Owner. Protect fume hoods from damage due to other construction activity, during installation and after acceptance.
11. Closeout activities
12. Demonstration and Training: Engage a factory-authorized service representative to train Owner’s personnel to adjust, operate, and maintain fume hoods.
    1. Perform training only after equipment has been installed, tested, and is operating correctly.
    2. Job specific warranty information.
    3. Supply cleaning information for different materials used.
    4. Supply part numbers for replaceable equipment, such as handles, hinges and screws.

END OF SECTION 11 53 13