

PART 1 - GENERAL

1.01 Work included:

- A. Laboratory fume hood ducts.
- B. Process or Capture hood ducts.
- C. Fume hood exhaust fans.

1.02 General:

- A. Ducts to be non-corroding material. All ductwork within the building envelope is to be under negative pressure at all times. Avoid flex connectors unless absolutely necessary; install and test to be air tight. Extend exhaust stacks above building vortex and provide low loss rain stacks.
- B. All duct fan and hood drains: corrosion resistant plastic, glass or type 316 stainless steel.
- C. Exhaust fans: Locate fans immediately inside buildings near the exhaust termination or discharge. Control variable speed fan motors by inlet static pressure.
- D. Exterior mounted fans only if approved by FS/DDC and FS/Maintenance. Design to prevent frost and ice buildup on exterior mounted fans, particularly on VAV ejector type fans that mix outdoor air with potentially very moist exhaust air.
- E. Consultant shall demonstrate that no cross contamination between exhaust fumes and air intakes shall occur. Design modeling may be necessary to demonstrate the avoidance of cross contaminations (ASHRAE Applications Handbook 2003, Ch. 44, or current version.)

PART 2 - PRODUCTS

2.01 Chemical Laboratory Fume Hood Exhaust Ductwork:

A. Interior Ductwork:

1. Fume hood ductwork: prefabricated single wall, uninsulated, Type 316 stainless steel. Elbows: smooth radius (die formed) or minimum of 5-gore elbows, 3-gore elbows not allowed. Welded joints on vertical risers and connections to fans.
2. Single wall, round spiral lockseam, Type 316 stainless steel ductwork may be used.
3. Small amounts of shop-fabricated single-wall Type 316 stainless steel ductwork will be required for equipment.

B. Exterior Ductwork:

1. Prefabricated double-wall, insulated, chimney stack. Liner: Type 316 stainless steel, jacket: aluminized steel. Insulation: 2 inch thick. Selkirk Metalbestos Model IPSC1, Heat Fab, Schebler, Alternate Brand request or Substitution Request required.
2. Small amount of shop-fabricated single-wall Type 316 stainless steel ductwork will be required for equipment connections and other miscellaneous applications.

2.02 Perchloric laboratory fume hood exhaust ductwork.

- A. Interior fume hood ductwork: uninsulated, welded single wall, Type 316 stainless steel. Slope is to drain back to fume hood. Provide with washdown system. Exhaust scrubber may also be necessary or appropriate; evaluate need for scrubber in lieu of or in addition to the standard duct washdown system.
- B. Exterior fume hood ductwork: insulated welded single wall, Type 316 stainless steel. Slope is to drain back to fume hood. Provide with washdown system. Insulation: 2 inch thick. Jacket: 0.020 inch thick embossed aluminum. Seal jacket with polyurethane caulk. Do not insulate the rainsleeve duct termination.
- C. Interior and exterior exhaust ductwork may also be constructed of uplasticized polyvinyl chloride. All washdown and insulation provisions indicated above still apply.
- D. Avoid horizontal offsets in vertical exhaust ducts and avoid long vertical exhaust ducts. Where long vertical runs cannot be avoided, additional provisions for duct washdown water removal may be needed due to the large volume of water produced by the numerous wash rings in the duct.
- E. Seal perchloric exhaust ductwork water tight to prevent perchloric acid laden water from leaking onto adjacent building materials or surfaces. If using PVC ductwork, use correct joint sealant materials and application procedures.

2.03 Radioisotope laboratory fume hood exhaust ductwork:

- A. Interior fume hood ductwork: uninsulated, welded single wall, Type 316 stainless steel. Slope is to drain back to fume hood. Provide with washdown system.
- B. Exterior fume hood ductwork: insulated welded single wall, Type 316 stainless steel. Slope is to drain back to fume hood. Provide with washdown system. Insulation: 2 inch thick. Jacket: 0.020 inch thick embossed aluminum. Seal jacket with polyurethane caulk. Do not insulate the rainsleeve duct termination.

2.04 Process or capture hood ductwork:

- A. General: Non-combustible or per requirements for Class 1 air duct materials, or UL 181.

- B. Steel Ducts: ASTM A525 galvanized steel sheet, lock-forming quality, having zinc coating of 1.25 oz per square foot for each side per ASTM A90.
- C. Fasteners: Rivets, bolts, or sheet metal screws.
- D. Sealant: Non-hardening, water resistant, fire resistive, compatible with mating materials, liquid used alone or with tape, or heavy mastic. Foster 30-02 or approved equivalent.
- E. Hanger rod: Steel, galvanized, threaded both ends, threaded one end, or continuously threaded.
- F. Capture hoods or connections to equipment: Hoods or ducted connections to equipment to be constructed from same material as duct work. Upon request and where applicable, hoods may be constructed from welded stainless steel, 304 or 316 acceptable.
 - 1. Above Autoclaves and cooking equipment, provide stainless steel capture hoods
- G. For high temperature applications such as generator exhaust or fumes from certain high temperature ovens, consult with FS/DDC on the type, insulation and placement of exhaust ducting.

2.05 Exhaust fans:

- A. Fabricate fans of materials resistant to the chemical in use, or that may be used in the future. Use appropriate lubricants for fan bearings, especially for perchloric acid fan bearings.
- B. Properly applied VAV exhaust fan systems may be used, coordinate control with Division 23 section Direct Digital Controls and Instrumentation.
- C. Specific project input needed from laboratory design professional.

PART 3 - EXECUTION

3.01 Installation - general:

- A. Provide openings in ductwork where required to accommodate thermometers, controllers, and fire protection system equipment. Provide pitot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage.
- B. Provide standard 45degree lateral wye branch fittings unless otherwise indicated.

END OF SECTION