

COLLEGE OF CHEMISTRY (herein called "CChem" or "owner")
UNIVERSITY OF CALIFORNIA, BERKELEY
FUME HOOD SPECIFICATION
REV. 3/9/05

PART 1 GENERAL

1.01 FUME HOOD GENERAL DESIGN REQUIREMENTS

- A. Fume hoods shall function as ventilated, enclosed workspaces, designed to capture, confine and exhaust fumes, vapors and particulate matter produced or generated within the enclosure.
- B. Design fume hoods for consistent and safe air flow through the hood face. Negative variations of face velocity shall not exceed 20% of the average face velocity at any measuring point.
- C. Average illumination of work area: Minimum 80 foot-candles. Work area shall be defined as the area inside the superstructure from side to side and from face of baffle to the inside face of the sash, and from the working surface to a height of 28 inches.
- D. Fume hood shall be designed to minimize static pressure loss. Maximum average static pressure loss readings taken three diameters above the hood outlet from four points, 90 degrees apart, shall not exceed the following maximums with sash in full open position:

Face Velocity	Measured S.P.L. (W.G.)
60 F.P.M.	.15 inches
100 F.P.M.	.30 inches

- E. Unless indicated otherwise, fume hood shall be installed for VAV operation. Damper controls by others; cut-outs for controls by fume hood manufacturer as coordinated with owner or owner's designee. Fume hood shall maintain essentially constant exhaust volume at any sash position for safety. Maximum variation in exhaust CFM, static pressure and average face velocity as a result of sash adjustment shall not exceed 5% for any sash position at the specified exhaust volume.

Fume hoods should be provided with an adjustable bypass that can be adjusted on site by the air balancer to satisfy minimum air flow requirements in the laboratory.

- F. Fume hoods shall be available in height, width, and depth as shown on design documents.
- G. Noise Criteria: Test data of octave band analysis verifying hood is capable of a 50 NC value when connected to a 50 NC HVAC source. Reading taken 3' in front of open sash at 100 fpm face velocity.
- H. Interior and exterior materials of construction and finishes shall meet the usage and this specification requirements.
- I. Fume hoods shall be field convertible from constant volume to VAV (or vice versa) by simple component replacement or addition. Change-over shall be accomplished without construction modifications and without special tools.

1.02 LINER SURFACE FINISH PERFORMANCE REQUIREMENTS

- A. Test procedure: Test procedures and results to be provided to owner. Test result

minimum requirements are listed below with ratings definition:

B. Evaluation ratings: Change in surface finish and function shall be described by the following ratings:

1. No Effect: No detectable change in surface material.
2. Excellent: Slight detectable change in color or gloss, but no change to the function or life of the work surface material.
3. Good: Clearly discernible change in color or gloss, but no significant impairment of work surface function or life.
4. Fair: Objectionable change in appearance due to surface discoloration or etch, possibly resulting in deterioration of function over an extended period.
5. Failure: Pitting, cratering or erosion of work surface material; obvious and significant deterioration.

C. Test Results, Fume Hood Liner (minimum requirements):

	<u>REAGENT LIST</u> <u>Concentrations by Weight</u>	<u>Test No. 1</u> <u>Rating Spills</u>	<u>Test No. 2</u> <u>Fumes</u>
1.	Sodium Hydroxide Flake	---	No Effect
2.	Sodium Hydroxide, 40%	Excellent	No Effect
3.	Sodium Hydroxide, 20%	Excellent	No Effect
4.	Sodium Hydroxide, 10%	Excellent	No Effect
5.	Ammonium Hydroxide, 28%	No Effect	No Effect
6.	Eldorado - Plus (Solution)	No Effect	No Effect
7.	Chloroform	Excellent	No Effect
8.	LpH SE (Solution)	No Effect	No Effect
9.	Trichloroethylene	Excellent	No Effect
10.	Monochlorobenzene	Excellent	No Effect
11.	Tincture of Iodine	Excellent	Excellent
12.	Methyl Alcohol	No Effect	No Effect
13.	Ethyl Alcohol	No Effect	No Effect
14.	Butyl Alcohol	No Effect	No Effect
15.	Phenol, 85%	Excellent	No Effect
16.	Cresol	Excellent	No Effect
17.	Sodium Sulfide, Saturated	Good	No Effect
18.	Furfural	Fair	No Effect
19.	Dioxane	No Effect	No Effect
20.	Zinc Chloride, Saturated	No Effect	No Effect
21.	Benzene	Excellent	No Effect
22.	Toluene	Excellent	No Effect
23.	Xylene	Excellent	No Effect
24.	Gasoline	Excellent	No Effect
25.	Naphthalene	Excellent	No Effect
26.	Methyl Ethyl Ketone	Excellent	No Effect
27.	Acetone	Excellent	No Effect
28.	Ethyl Acetate	Excellent	No Effect
29.	Amyl Acetate	Excellent	No Effect
30.	Ethyl Ether	Excellent	No Effect
31.	Silver Nitrate, 10%	Good	No Effect
32.	Di Methyl Formamide	No Effect	Excellent
33.	Formaldehyde, 37%	No Effect	No Effect
34.	Formic Acid, 88%	No Effect	No Effect
35.	Acetic Acid, Glacial	No Effect	No Effect
36.	Dichloro Acetic Acid, 93%	Excellent	Excellent

37.	Chromic Acid, Saturated	Good	No Effect
38.	Phosphoric Acid, 85%	No Effect	No Effect
39.	Sulfuric Acid, 33%	No Effect	No Effect
40.	Sulfuric Acid, 77%	Excellent	No Effect
41.	Sulfuric Acid, 93%	Good	No Effect
42.	Hydrogen Peroxide, 30%	No Effect	No Effect
43.	Acid Dichromate	Excellent	No Effect
44.	Nitric Acid, 20%	Excellent	No Effect
45.	Nitric Acid, 30%	Excellent	No Effect
46.	40 & 47 Equal Parts	Excellent	Good
47.	Nitric Acid, 70%	Excellent	Good
48.	Hydrochloric Acid, 37%	No Effect	Excellent
49.	Hydrofluoric Acid, 48%	No Effect	Failure

1.03 SUBMITTALS

- A. Shop Drawings: Equipment should not go into fabrication prior to owner approved shop drawings. Shop drawings to be submitted as scheduled by CChem or the Owner's Rep. Indicate equipment locations, large scale plans, elevations, cross sections, rough-in and anchor placement dimensions and tolerances and all required clearances. Any alternatives or deviations from the spec must be clearly identified as such on shop drawings.
- B. Product Data: Submit manufacturer's data for each component and item of laboratory equipment specified. Include component dimensions, configurations, construction details, joint details, and attachments, utility and service requirements and locations. Include liner and exterior finish tests by independent third party.
- C. Samples: Submit 3 x 6 inch samples of finish for fume hood, work surfaces and for other pre-finished equipment and accessories for selection by the owner or owner's rep.
- D. Test Reports: Submit test reports on **each** size and type of hood verifying conformance to test performances specified. Test report must accompany **each** hood as part of installation and usage package. Submit independent test reports as required by specification.
- E. Instructions: Submit for review and approval
 - 1. Instructions to be inscribed on instruction plate to be attached to hood, as specified in Part 2 of this Section.
 - 2. Written instructions in booklet form providing additional details on safe and proper operation and maintenance.
- F. Independent validation: Written verification of compliance to UL-1805 fume hood standard is mandatory.

1.04 QUALITY ASSURANCE

- A. Single source responsibility: Fume hood casework, work surfaces, and other laboratory equipment and accessories shall be manufactured or furnished by a single laboratory furniture company.
- B. Manufacturer's qualifications:
 - 1. Five years or more experience in manufacture of laboratory casework and equipment of type specified.
 - 2. Ten installations of equal or larger size and requirements. Provide contact at each.

3. UL 1805 Specification: (Mandatory)
Fume Hood must be Underwriters Laboratories subject 1805 classified. The 1805 standard covers electrical and mechanical hazards, investigates the flammability of materials and measures the effectiveness of airflow characteristics. Proper labeling must be affixed to the face of each fume hood indicating classification to the UL 1805 standard for Laboratory Fume Hoods. UL listing covering electrical components only or other listings that do not encompass all issues covered in UL 1805 is insufficient. All factory testing shall be performed in a U.L. certified test facility.
- C. Installer's qualifications: Factory certified by the manufacturer. Manufacturer to be fully responsible for quality of installation.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Schedule delivery of equipment so that spaces are sufficiently complete that equipment can be installed immediately following delivery. Delivery schedule to be coordinated with University of California project manager or General Contractor (as defined by contract) to ensure that there are no project delays.
- B. Protect finished surfaces from soiling or damage during handling and installation. Keep covered with polyethylene film or other protective coating.
- C. Protect all work surfaces throughout construction period with 1/4" minimum corrugated cardboard completely covering the top and securely taped to edges. Mark cardboard in large lettering "No Standing".
- D. Protect all existing building surfaces while transporting materials including, but not limited to elevators and corridors.
- E. There is to be no casework modification (e.g., cutting, etc.) outside of the designated work area. Any exceptions to be approved in advance by the CChem Director of Engineering or Building Manager.

PART 2 PRODUCTS

2.01 FUME HOOD MATERIALS

- A. Steel: High quality, cold rolled, mild steel meeting requirements of ASTM A366; gauges U.S. Standard and galvanized.
- B. Stainless steel: Type 304; gauges U.S. Standard.
- C. Ceiling closure panels: Minimum 18 gauge; finish to match hood exterior.
- D. When bypass is required: Low resistant downdraft type bypass; 18 gauge steel chamber. All bypass air shall enter top of bypass chamber and enter hood in a downflow direction. **Or approved alternative.**
- E. Safety glass: 7/32" thick laminated safety glass.
- F. Sash cables: Stainless steel, uncoated, 1/8" diameter military spec quality. **Or approved alternative system.**
- G. Sash guides: Corrosion resistant poly-vinyl chloride.
- H. Pulley assembly for sash cable: 2" diameter, zinc dichromate finish, ball bearing type,

with cable retaining device. Nylon tired - not acceptable. **Or approved alternative system.**

- I. Sash pull: Full width corrosion resistant plastic, stainless steel or steel with chemical resistant powder coating. Maximum 1.5" thick. **Or approved alternative system.**
- J. Gaskets: 70 durometer PVC for interior access panels. Gasket interior access panels to eliminate air leakage and to retain liquids inside hood.
- K. Fastenings:
 - 1. Exterior structural members attachments: Sheet metal screws, zinc plated.
 - 2. Interior fastening devices concealed. Exposed screws not acceptable. (Screw head "caps" not acceptable.)
 - 3. Exterior side access panel member fastening devices to be corrosion resistant, non-metallic material. Latch must be flush type. Exposed screws – not acceptable.
- L. Instruction plate: Corrosion resistant or plastic plate attached to the fume hood exterior with condensed information covering recommended locations for apparatus and accessories, baffle settings and use of sash.

2.02 FUME HOOD CONSTRUCTION

- A. Superstructure: Rigid, self supporting assembly of double wall construction.
 - 1. Wall consists of a sheet steel outer shell and a corrosion resistant inner liner, and houses and conceals steel framing members, attaching brackets and remote operating service fixture mechanisms and services. Panels must be attached to a full frame construction, minimum 14 gauge galvanized members. Panels and brackets attached to eliminate screw heads and metallic bracketry from hood interior.
 - 2. Access to fixture valves concealed in wall provided by exterior removable access panels, gasketed access panels on the inside liner walls, or through removable front posts.
- B. Exhaust outlet: Shape of exhaust outlet to be specified on shop drawings for owner's approval.
- C. Access opening perimeter: Air foil or streamlined shape with all right angle corners radiused or angled. Bottom horizontal foil shall provide nominal one inch bypass when sash is in the closed position. Bottom foil shall provide access area sufficient in size to pass through hospital grade electrical plugs. Bottom foil: Steel with black powder coating to increase acid and abrasion resistance. Air foil and sill are to extend no more than 1.5" in front of work surface.
- D. Fume hood sash: Fume hoods to be combination vertical/horizontal sash type. Full view type sash with clear, unobstructed, side-to-side view of fume hood interior and service fixture connections.
 - 1. Bottom sash rail: 2" maximum, 18 gauge steel with powder coating finish. Provide integral formed, flush pull the full width of bottom rail.
 - 2. Set safety glass into rails in deep form, extruded poly-vinyl chloride glazing channels.
 - 3. Open and close sash against rubber bumper stops.
 - 4. Sliding glass panes in sashes to be fully framed with stainless steel, welded seams **or approved alternate.**
 - 5. Set sash stop at 18" on one side of sash capable of being manually overridden for full height access to hood interior. Submit sash stop material or

mechanism for approval by owner.

- E. Sash control system: System must prevent sash tilting and permit ease of operation at any point along full width pull. Maximum 7 pounds pull required to raise or lower sash throughout its full length of operating sash opening. Design system to hold sash at any position without creep and to prevent sash drop in the event of cable failure. Life cycle test sash and weight. Provide independent test data. Open and close sash against rubber bumper stops.
- F. Fume hood liner: Poly-resin: Reinforced polyester panel; smooth finish and white color in final appearance. Flexural strength: 14,000 psi. Flame spread: 15 or less per U.L. 723 and ASTM E84-80. Baffle must be same material as liner. Metallic baffles, brackets or supports on hood interior – not acceptable.
- H. Baffles: Baffles providing controlled air vectors into and through the fume hood must be fabricated of the same material as the liner. Provide exhaust slots full height on vertical sides of the baffle with upper and lower slots adjustable. Provide fixed, permanently open horizontal slot 17” above the work surface. Minimum depth of 19” for interior work space is required at the extreme upper portion of the fume hood. All baffles, supports, and brackets to be non-metallic.
- I. Remote baffle adjustment: One handed, single point control, accomplished while hood is in use, without disturbing apparatus, from area outside hood or in close proximity to exterior of hood and easily accessible. Should permit setting for high thermal loading, heavier than air gases or fumes generated near work surface, and normal/average operation. Detail to appear on shop drawings for owner approval.
 - 1. Must comply with OSHA Lab Standard Guidelines. (Easily reached/adjusted with only one arm in hood.)
 - 2. Non-metallic supports and fasteners required inside of hood.
- J. Service fixtures and fittings: Color coded fixture outlets mounted inside the fume hood controlled from the exterior with color coded index handles.
 - 1. Valves: Needle point type with self-centering cone tip and seat of hardened stainless steel. Tip and seat shall be removable and replaceable.
 - 2. Provide piping for all service fixtures from valve to outlet: Copper for water, air and vacuum and black iron for natural gas services. Extend piping for all utilities from the valve to 6” above fume hood for connection to building systems by others. Open end of pipe should be protected prior to delivery to prevent contamination with construction dust.
 - 3. Fixtures exposed to hood interior: Brass with chemically resistant color coded powder coating.
 - 4. Remote control handles: Four-arm handle (unless indicated otherwise on design documents) with nylon color-coded index buttons.

COLOR CODING:

O2 light green
CA orange
GAS dark blue
VAC yellow
N2 brown
ICW dark green
SG light blue (Special Gas)

- 5. Services as shown or specified.

6. Handle and outlet nozzle will be color coded to the media, with the same polyester powder lacquer finish. (See above for color coding.) Outlet nozzles shall be made of the same high quality brass as the valve bodies. Other materials may be in contact with media where appropriate.
 7. Fixtures are to be provided with easy-to-mount attachment device for secure mounting in deck or wall mounted applications. System to be installed with simple hand tools.
 8. Fittings are to be constructed to operate with the following maximum working pressure without leak or failure.
 - Water Fittings: 145 PSI
 - Non-Burning Gas: 145 PSI
 - Burning Gases: 100 PSI
 - Special Water Fittings: 145 PSI
 - Oxygen Fittings: 145 PSI
 - Special Gas: 145 PSI
 9. All outlets shall have detachable serrated nozzles.
 10. All valves shall be front-loaded for ease of access and maintenance at point of use.
 11. Industrial cold water fixture to be installed with vacuum breaker.
- L. Hood light fixture: Two lamp, rapid start, UL listed fluorescent light fixture with sound rated ballast installed on exterior of roof. Provide safety glass panel cemented and sealed to the hood roof.
1. Interior of fixture: White, high reflecting plastic enamel.
 2. Size of fixture: Largest possible up to 48" for hoods with superstructures up to six feet. Provide two 36" fixtures for hoods with eight foot superstructures.
 3. Include lamps with fixtures. Hoods without lamps – not acceptable.
 4. Illumination: Per performance values, Part 1 of this Section.
 5. Access to light thru lintel panel – no tools required.
- M. Electrical services: GFI protected wire grounding type receptacles rated at 120 V.A.C. at 20 amperes. Provide 250 V.A.C. receptacles where specified. Flush plates: Black acid resistant thermoplastic. Provide three duplex outlets on non-ADA superstructure and two duplex outlets on ADA superstructure (reference design documents for location).
- N. Work surfaces: 1-1/4" thick surface, dished a nominal 1/2" to contain spills.
1. Molded resin work surfaces.
 2. Provide 2" cut-out in work surface for pump cabinet discharge hose. Cut-out to be installed immediately in front of cup sink above pump cabinet.
 3. Provide 1/4" berm around rim of cup sinks and pump cabinet discharge cut-out.
- O. Safety Monitor/Alarm System: Provide cut-out for owner furnished VAV controls. For non-VAV hoods and/or when so indicated in design documents, install an owner approved monitoring device.
- P. Specialized under the hood cabinets
1. Flammable Cabinets:
 - a) Justrite Cabinets, 24" model 25712 **Or approved alternative.**
 - b) Justrite Cabinets, 36" model 25732 **Or approved alternative.**
 - c) Note that the 24" Justrite model is not a designated under-counter model. It does not have a toe kick. This is not a problem because the air foil of the fume hood keeps you from standing right up against the

cabinet. Because standard casework may be 35 1/4" or 35 1/2" high, a shim or filler might be required under the hood to even the height of the flammable cabinets with the pump cabinet. As an alternative, the cabinet comes with leveling feet that might be sufficiently adjustable to bring the cabinet up to standard casework height. The 24" model comes with venting on the sides. The Manufacturer (Justrite) is willing to provide cabinets with back venting when required. Because the cost of the cabinet is low (~\$379), the nominal additional charge is acceptable.

- d) Flammable cabinets to be self-closing and vented into the hood behind the baffle. Venting to be via solid metal or metal flex hose.
- e) Finish: Paint to match hood exterior.
- f) Cabinet handles to be lever handle.

2. Acid Cabinets:

- a) Justrite Cabinets, 24" model P25710 **Or approved alternative.**
- b) Justrite Cabinets, 36" model 25702 **Or approved alternative.**
- c) Acid cabinets to be non-self closing. Vent into fume hood behind baffle using non-metallic acid resistant material.
- d) Finish: Paint to match hood exterior.
- e) Cabinet handles to be lever handle.

3. Pump Cabinets:

- a) Approved cabinet construction and pump platform:
 - 1) Construction: Metal cabinet painted to match exterior fume hood surface. Surfaces of doors, flush panel faces shall align with cabinet fronts without overlap of case ends or top rail. Horizontal and vertical case shell members (panels and top rails) shall meet in the same plane without overlap, cracks or crevices.
 - 2) Vacuum pump storage to provide a means to store and vent vacuum pumps and their emissions and heat loads.
 - 3) Vacuum pump cabinet shall have hinged doors with integral toe space without a cabinet bottom. Vacuum pump cabinet shall have removable back panel(s) for utility access and visual inspection. Back panel shall incorporate an integral vent hole for a separate vent assembly.
 - 4) Vacuum pump cabinet shall incorporate acoustical insulation on the interior door panels, sides, back and underside of the top panel. Insulation shall be an open cell foam of clonal design. Sound insulation shall not interfere with openings to dissipate heat.
 - 5) Storage unit shall incorporate an integral electrical switch (120V, 20 amp) with pilot light to indicate the operational mode of the vacuum pump unit.
 - 6) Storage unit shall have an electrical duplex outlet, located in the rear of the cabinet, for the vacuum pump plug end. Outlet to be accessible from the inside of the cabinet. Outlet shall be hard wired to the electrical switch.
 - 7) Separate mobile platform shall be capable of supporting 300 lbs. Front two casters shall be locking/swivel models. Lipped construction shall safely contain any accidental spills.
 - 8) Nominal Dimensions: Vacuum Pump Cabinet
As specified on design documents.
 - 9) Nominal Dimensions: Mobile Pump Platform
Maximum size feasible within pump cabinet to allow ease of

use.

- 10) **Or approved alternative.**
- 11) Provide 2" cut-out lin work surface above pump cabinet, in front of cup sink, for pump discharge hose.

- b) Minimal requirements for approval of alternative.
 - 1) Pull-out tray or platform for pump to allow access to entire pump for maintenance.
 - 2) Sound insulation.
 - 3) Venting of cabinet for heat reduction.
 - 4) Maximum size of pump support within cabinet dimensions.
 - 5) Secondary containment under pump.

4. ADA-Compliant Hoods

- a. Acid Cabinet (fixed)
Justrite 24" wide (x 32" high) manual closing ADA-compliant Model Centura 25624 **or approved equal**. (Model number is preceded by letter L if hinge is to be on left side.) Vent from back of cabinet (high) to space behind hood baffle using pvc piping.
- b. Pump Cabinet (fixed)
18" wide x 32" high. Other than size, follow pump cabinet specs listed above.
- c. Non-fixed (removable) 30" wide (x 32" high) self-closing flammable storage cabinet to be slid into in 30" knee space (no base cove required). Model: Justrite Centura SC25230. Vent from back of cabinet (low) to space behind hood baffle using stainless steel flex connection.

2.03 METAL FINISH

A. Chemical Resistance, Test Procedure

1. Test procedures and results to be provided to owner. Test result minimum requirements are listed below with evaluation ratings definition:
2. Evaluation Ratings: Change in surface finish and function shall be described by the following ratings:
 - a. Level 0: No detectable change
 - b. Level 1: Slight change in color or gloss.
 - c. Level 2: Slight surface etching or severe staining.
 - d. Level 3: Pitting, cratering, swelling or erosion of coating. Obvious and significant deterioration.
3. a. Hoods are to be tested with the following reagents. Manufacturer to provide owner with test method used for each.

CHEMICAL Reagent

1. Acetate, Amyl
2. Acetate, Ethyl
3. Acetic Acid, 98
4. Acetone

5. Acid Dichromate, 5%
6. Alcohol, Butyl
7. Alcohol, Ethyl
8. Alcohol, Methyl
9. Ammonium Hydroxide, 28%
10. Benzene
11. Carbon Tetrachloride
12. Chloroform
13. Chromic Acid, 60%
14. Cresol
15. Dichlor Acetic Acid
16. Dimethylformamide
17. Dioxane
18. Ethyl Ether
19. Formaldehyde, 37%
20. Formic Acid, 90%
21. Furfural
22. Gasoline
23. Hydrochloric Acid, 37%
24. Hydrochloric Acid, 48%
25. Hydrogen Peroxide, 3%
26. Iodine, tincture of
27. Methyl Ethyl Ketone
28. Methylene Chloride
29. Mono Chlorobenzene
30. Naphthalene
31. Nitric Acid, 20%
32. Nitric Acid, 30%
33. Nitric Acid, 70%
34. Phenol, 90%
35. Phosphoric Acid, 85%
36. Silver Nitrate, Saturated
37. Sodium Hydroxide, 10%
38. Sodium Hydroxide, 20%
39. Sodium Hydroxide, 40%
40. Sodium Hydroxide, Flake
41. Sodium Hydroxide, Saturated
42. Sulfuric Acid, 33%
43. Sulfuric Acid, 77%
44. Sulfuric Acid, 96%
45. Sulfuric Acid, 77% and
Nitric Acid, 70% equal parts
46. Toluene
47. Trichloroethylene
48. Xylene
49. Zinc Chloride, Saturated

- B. Acceptance Level
Laboratory grade finishes should result in no more than four Level 3 conditions.

2.04 SOURCE QUALITY CONTROL TESTING OF FUME HOODS

- A. Evaluation of manufacturer's standard product shall take place in a certified testing facility, with testing personnel, samples, apparatus, instruments, and test materials supplied by the facility at no cost to the Owner.
- B. Submit test report consisting of the following test parameters and equipment for each

hood width and configuration specified.

- C. Hood shall achieve a rating of 4.0 AM 0.05 PPM or better. Tested to ASHRAE-110-1995.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Installation:
 - 1. Install fume hoods and equipment in accordance with manufacturer's instructions.
 - 2. Install equipment plumb, square, and straight with no distortion and securely anchored as required.
 - 3. Secure work surfaces to casework and equipment components with material and procedures recommended by the manufacturer.
- B. Accessory installation: Install accessories and fittings in accordance with manufacturer's recommendations.

3.02 FIELD QUALITY CONTROL TESTING OF FUME HOODS

- A. Field testing requirements:
 - 1. Perform tests in field to verify proper operation of the fume hoods before they are put in use, using only qualified personnel.
 - 2. Correct any unsafe conditions disclosed by these tests before request of test procedures.

3.03 ADJUSTING

- A. Repair or remove and replace defective work, as directed by owner or owner's rep. upon completion of installation.
- B. Adjust sash, fixtures, accessories and other moving or operating parts to function smoothly.

3.04 CLEANING

- A. Clean equipment, touch up as required.

3.05 PROTECTION OF FINISHED WORK

- A. Provide all necessary protective measures to prevent exposure of equipment from exposure to other construction activity.
- B. Advise contractor of procedures and precautions for protection of material and installed fume hoods from damage by work of other trades.

END OF SECTION