

## SECTION 15870 - COMMERCIAL KITCHEN HOODS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes Type I commercial kitchen hoods.
- B. Related Sections include the following:
  - 1. Division 15 Section "Power Ventilators" for exhaust fans.
  - 2. Division 16

#### 1.3 DEFINITIONS

- A. Listed Hood: A hood tested according to UL 710 by a testing agency acceptable to authorities having jurisdiction.
- B. Standard Hood: A hood that complies with design, construction, and performance criteria of applicable national and local codes.
- C. Type I Hood: A hood designed for grease exhaust applications.

#### 1.4 SUBMITTALS

- A. Product Data: For the following:
  - 1. Grease removal devices.
  - 2. Fire-suppression systems.
  - 3. Lighting fixtures.
  - 4. Supply fan
  - 5. Exhaust fan
  - 6. Hood.
  - 7. Motorized fire damper
  - 8. Motorized damper
  - 9. Insulated make-up air plenum
- B. Piping Diagrams: Detail fire-suppression piping and components and differentiate between manufacturer-installed and field-installed piping. Include roughing-in requirements for drain connections. Show cooking equipment plan and elevation to illustrate fire-suppression nozzle locations.

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## 1.5 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," for hangers and supports; and AWS D9.1, "Sheet Metal Welding Code," for joint and seam welding.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Hoods and fans shall be U.L. Listed.
- D. SMACNA Compliance:
  - 1. Comply with SMACNA's "Kitchen Equipment Fabrication Guidelines," Appendix 1, "Guidelines for Seismic Restraints of Kitchen Equipment."

## 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions of food service equipment installation areas by field measurements before fabrication.
  - 1. Established Dimensions: Where field measurements cannot be made without delaying the work, establish required dimensions using approved food facility equipment Shop Drawings. Coordinate fabrication with food facility equipment manufacturer to ensure that actual dimensions correspond to established dimensions.

## 1.7 COORDINATION

- A. Coordinate equipment layout and installation with other Work, including light fixtures, HVAC equipment, and fire-suppression system components.
- B. Coordinate wiring by Division 16 with installation of fire suppression control system and power for dishwasher and kitchen hood fans.
  - 1. Division 16 provides and installs "on/off" switches for exhaust fans and hood lights.
  - 2. Division 16 wires automatic gas solenoid valve operation with fire suppression control system.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Commercial Kitchen Hoods:
    - a. Captive-Aire Systems.
    - b. Greenheck.

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2. Wet-Chemical Fire-Suppression Systems:
  - a. Ansul Incorporated; a Tyco International Ltd. Company.
  - b. Badger Fire Protection, Inc.
  - c. Fenwall Safety Systems, Inc.; Div. of Kidde Technologies, Inc.
  - d. Pyro Chem, Inc.

## 2.2 HOOD MATERIALS

- A. Stainless-Steel Sheet: ASTM A 666, Type 304.
  1. Minimum Thickness: 18Ga.
  2. General: Comply with SSINA's "Finishes for Stainless Steel" for recommendations for applying and designating finishes.
  3. Remove tool and die marks and stretch lines or blend into finish. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
  4. Concealed Stainless-Steel Surfaces: ASTM A 480/A 480M, No. 2B finish (bright, cold-rolled, unpolished finish).
  5. Exposed Surfaces: ASTM A 480/A 480M, No. 4 finish (bright, directional polish).
  6. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- B. Sealant: ASTM C 920; Type S, Grade NS, Class 25, Use NT. Elastomeric sealant shall be NSF certified for commercial kitchen hood application. Sealants, when cured and washed, shall comply with requirements in 21 CFR, Section 177.2600, for use in areas that come in contact with food.
  1. Color: As selected by Architect from manufacturer's full range.
  2. Backer Rod: Closed-cell polyethylene, in diameter larger than joint width.
- C. Gaskets: NSF certified for end-use application indicated; of resilient rubber, neoprene, or PVC that is nontoxic, stable, odorless, nonabsorbent, and unaffected by exposure to foods and cleaning compounds, and passes testing according to UL 710.

## 2.3 HOOD FABRICATION, GENERAL

- A. Welding: Use welding rod of same composition as metal being welded. Use methods that minimize distortion and develop strength and corrosion resistance of base metal. Make ductile welds free of mechanical imperfections such as gas holes, pits, or cracks.
  1. Welded Butt Joints: Full-penetration welds for full-joint length. Make joints flat, continuous, and homogenous with sheet metal without relying on straps under seams, filling in with solder, or spot welding.
  2. Grind exposed welded joints flush with adjoining material and polish to match adjoining surfaces.
  3. Where fasteners are welded to underside of equipment, finish reverse side of weld smooth and flush.

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4. Coat concealed stainless-steel welded joints with metallic-based paint to prevent corrosion.
- B. For metal butt joints, comply with SMACNA's "Kitchen Equipment Fabrication Guidelines."
  - C. Where stainless steel is joined to a dissimilar metal, use stainless-steel welding material or fastening devices.
  - D. Form metal with break bends that are not flaky, scaly, or cracked in appearance; where breaks mar uniform surface appearance of material, remove marks by grinding, polishing, and finishing.
  - E. Sheared Metal Edges: Finish free of burrs, fins, and irregular projections.
  - F. In food zones, as defined in NSF, fabricate surfaces free from exposed fasteners.
  - G. Cap exposed fastener threads, including those inside cabinets, with stainless-steel lock washers and stainless-steel cap (acorn) nuts.
  - H. Fabricate pipe slots on equipment with turned-up edges sized to accommodate service and utility lines and mechanical connections.
  - I. Fabricate enclosures, including panels, housings, and skirts, to conceal service lines, operating components, and mechanical and electrical devices including those inside cabinets, unless otherwise indicated.
  - J. Fabricate equipment edges and backsplashes according to SMACNA's "Kitchen Equipment Fabrication Guidelines."

#### 2.4 TYPE I EXHAUST HOOD FABRICATION

- A. Equal to Captive aire ND-100-EMD Backshelf Canopy with motorized Fire damper.
- B. Dimensions: Overall length = 48 in., overall width = 45 in.
- C. Weld all joints exposed to grease with continuous welds and make grease removal devices and makeup air diffusers easily accessible for cleaning.
  1. Hoods shall be listed and labeled, according to UL 710, by a testing agency acceptable to authorities having jurisdiction.
  2. Include access panels as required for access to fire dampers and fusible links.
  3. Exhaust-Duct Collars: Minimum 0.0625-inch- thick stainless steel at least 3 inches long, continuously welded to top of hood and at corners. Fabricate a collar with a 0.5-inch-wide duct flange.
- D. Hood Configuration: compensating with insulated back supply plenum.
- E. Hood Style: Back-shelf canopy.

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- F. Removable Grease Extractor: Removable, stainless-steel extractor, at least 0.0781 inch thick. Hood with extractor must be tested according to UL 710.
  - 1. Provide Filter removal tool.
- G. Panels:
  - 1. Provide and install stainless steel Enclosure panels to span between hood and ceiling.
- H. Light Fixtures: UL-listed, surface-mounted, fixtures and lamps with lenses sealed vaportight. Wiring shall be installed in stainless-steel conduit on hood exterior. Number and location of fixtures shall provide a minimum of 70 fc on cooking surface below hood.
  - 1. Incandescent Lighting Fixtures: Comply with UL 1571.
- I. Wet-Chemical Fire-Suppression System: Pre-engineered distribution piping designed for automatic detection and release or manual release of fire-suppression agent by hood operator. Fire-suppression system shall be listed and labeled by a testing agency acceptable to authorities having jurisdiction. Fire Suppression System components located in a built-in utility cabinet.
  - 1. Steel Pipe, NPS 2 and Smaller: ASTM A 53/A 53M, Type S, Grade A, Schedule 40, plain ends.
  - 2. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300.
  - 3. Pipe Covers: Chrome-plated aluminum tubing.
  - 4. Piping, fusible links and release mechanism, tank containing the suppression agent, and controls shall be factory installed. Controls shall be in stainless-steel control cabinet mounted on wall. Furnish manual pull station for wall mounting adjacent to hood. Exposed piping shall be covered with stainless-steel sleeves. Exposed fittings shall be chrome plated.
  - 5. Liquid Extinguishing Agent: Non-corrosive, low-pH liquid.
  - 6. Furnish an automatic *electric-operated* gas shutoff valve with clearly marked open and closed indicator for field installation.
  - 7. Fire-suppression system controls shall be integrated with controls for fans, lights, and fuel supply and located in a single cabinet for each group of hoods immediately adjacent.
  - 8. Wiring shall have color-coded, numbered terminal blocks and grounding bar. Spare terminals for fire alarm, optional wiring to start fan with fire alarm, red pilot light to indicate fan operation, and control switches shall all be factory wired in control cabinet with relays or starters.
  - 9. Hood Controls: See Section 15940.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

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### 3.2 INSTALLATION

- A. Install hoods level and plumb.
- B. Complete field assembly of hoods where required.
  - 1. Make closed butt and contact joints that do not require filler.
  - 2. Grind field welds on stainless-steel equipment smooth, and polish to match adjacent finish. Comply with welding requirements in Part 2 "General Hood Fabrication" Article.
- C. Install hoods and associated services with clearances and access for maintaining, cleaning, and servicing hoods, grease removal devices, and fire-suppression systems according to manufacturer's written instructions and requirements of authorities having jurisdiction.
- D. Make cutouts in hoods where required to run service lines and to make final connections.
- E. Securely anchor and attach items and accessories to walls, floors, or bases with stainless-steel fasteners, unless otherwise indicated.
- F. Install hoods to operate free from vibration.
- G. Install trim strips and similar items requiring fasteners in a bed of sealant. Fasten with stainless-steel fasteners at 48 inches o.c. maximum.
- H. Install sealant in joints between equipment and abutting surfaces with continuous joint backing, unless otherwise indicated. Provide airtight, watertight, vermin-proof, sanitary joints.
- I. Install lamps, with maximum recommended wattage, in equipment with integral lighting.

### 3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to machine with clearance to allow service and maintenance.
- C. Duct Connections: Comply with applicable requirements in Division 15 Section "Duct Accessories" for flexible connectors on makeup air supply duct. Weld exhaust-duct connections.
- D. Fire-Suppression Piping: Install piping connections for remote-mounted suppression systems according to NFPA 17, "Wet Chemical Extinguishing Systems."

### 3.4 FIELD QUALITY CONTROL

- E. Testing: Owner will engage a qualified testing agency to perform the following field quality-control testing:
- F. Testing: See Division 15 Section, "Testing, Adjusting and Balancing."

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- G. Testing: Engage a qualified testing agency to perform the following field quality-control testing:
- H. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.
  - 1. Test each equipment item for proper operation. Repair or replace equipment that is defective, including units that operate below required capacity or that operate with excessive noise or vibration.
  - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  - 3. Test motors and rotating equipment for proper rotation and lubricate moving parts according to manufacturer's written instructions.
  - 4. Test liquid-carrying and water, drain, and gas components for leaks. Repair or replace leaking components.
- I. Remove malfunctioning units, replace with new units, and retest as specified above.

#### 3.4 ADJUSTING

- A. Set initial temperatures, and calibrate sensors.
- B. Set field-adjustable switches.

#### 3.5 CLEANING

- A. Remove protective coverings and clean and sanitize hoods and associated services, both inside and out, according to manufacturer's written instructions.
- B. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.

END OF SECTION 15870

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