

## **SECTION 238216 – HVAC AIR COILS**

**Latest Edition: 06-07-2022 See Underlined Text for Edits.**

(Engineer shall edit specifications and blue text in header to meet project requirements. This includes but is not limited to updating Equipment and/or Material Model Numbers indicated in the specifications and adding any additional specifications that may be required by the project. Also turn off all “Underlines”.)

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section and all other sections of Division 23.

#### **1.2 SUMMARY**

- A. This section includes the requirements for hydronic air coils located in air handling units, energy recovery assemblies, plenums or ductwork as follows: <Edit for Project>
  - 1. Chilled water cooling coils.
  - 2. Hot water heating coils.
  - 3. Steam heating coils.
  - 4. Energy recovery (Preheat) coils, 40% glycol (Ethylene Glycol Dowtherm SR-1).
  - 5. Energy Recovery (Exhaust) coils, 40% glycol (Ethylene Glycol Dowtherm SR-1).
- B. See Division 23 Specification Section “Heating and Cooling Terminal Units” for coil requirements for air terminal units.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each specified product, include manufacturers cut sheets, dimensional data, performance data, installation instructions, wirings diagrams, power requirements, specified options, and warranty information.
- B. For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each air coil.
  - 2. Include rated capacities, operating characteristics, and pressure drops for each air coil.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which coil location and ceiling-mounted access panels are shown and coordinated with each other.

## 1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Include a copy of each approved submittal along with any applicable maintenance data in the project operation and maintenance manual.

## 1.6 QUALITY ASSURANCE

- A. ASHRAE Compliance: Comply with applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

## 1.7 COORDINATION

- A. Coordinate layout and installation of the coils, related casings, and/or duct connections with other trades to maintain the required clearance for maintenance.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Coils shall be delivered in factory protective packaging, including caps on open end connections for pipes and vents to prevent rain and other foreign matter from getting inside the openings.
- B. Store coils in a secure, dry weather tight enclosure retaining the protective packaging until the coils are ready to be installed.
- C. Lift and support the coils with the manufacturer's designated lifting or supporting points.

## 1.9 WARRANTY AND GUARANTEE

- A. See Division 23 Specification Section "General Mechanical Requirements – HVAC" for warranty and guarantee requirements.

## **PART 2 - PRODUCTS**

### 2.1 GENERAL PRODUCT REQUIREMENTS

- A. Equipment Design and Selection: Air coils shall be designed and selected in accordance with the scheduled capacities on the drawings and the requirements of this specification. All coils shall have the ARI Standard 410 certification and bear the ARI symbol. Coil manufacturer must be ISO 9002 certified.
- B. Basis of Design: The basis of design for air coils utilized for energy recovery and/or installed in ductwork or plenums shall be products manufactured by Heatcraft Worldwide Refrigeration.
- C. Other Acceptable Manufacturers: Subject to compliance with requirements, provide coils by one (1) of the following manufactures.

1. Aerofin Inc.
2. Trane
3. Carrier

D. Other HVAC Coils: For other HVAC air coils associated with air handling units, terminal reheat units, fan coil units, cabinet heaters, convectors, and unit heaters, see the Division 23 Specification Sections for that equipment.

## 2.2 HYDRONIC COILS

- A. Coils shall be counter flow design, air to water.
- B. Performance Ratings: Tested and rated according to AHRI 410 and ASHRAE 33.
- C. Minimum Working Pressure/Temperature Ratings: The minimum working pressure/temperature shall be 200 psig, 325°F.
- D. Source Quality Control: Factory tested to 300 psig.
- E. Tubes: Tubing and return bends shall be constructed from UNS 12200 seamless copper conforming to ASTM B75 and ASTM B251 for standard pressure applications. Copper tube temper shall be light annealed with a maximum grain size of 0.040 mm and a maximum hardness of Rockwell 65 on the 15T scale. Tubes shall be mechanically expanded to form an interference fit with the fin collars. Coil tube size and wall thickness' are 5/8"x0.020 and 1/2"x0.016 and 1"x.035 standard for copper,
- F. Fins: Coils shall be of plate fin type construction providing uniform support for all coil tubes. Coils are to be manufactured with die-formed aluminum, copper, stainless steel or carbon steel fins with self-spacing collars which completely cover the entire tube surface. The fin thickness shall be 0.0075 +/-5% unless otherwise specified. Manufacturer must be capable of providing self-spacing die-formed fins 4 through 14 fins/inch with a tolerance of +/-4%.
- G. Headers: Headers shall be constructed from UNS 12200 seamless copper conforming to ASTM B75 and ASTM B251 for standard pressure applications. Coil return headers are to be equipped with factory-installed 1/2 ft. air vent connection placed at the highest point available on face of the header. Tube-to-header holes are to be intruded inward such that the landed surface area is three times the core tube thickness to provide enhanced header to tube joint integrity. All core tubes shall evenly extend within the inside diameter of the header no more than 0.12 inch. End caps shall be die-formed and installed on the inside diameter of the header such that the landed surface area is three times the header wall thickness.
- H. Frames: Galvanized steel channel frame, minimum 0.052 inch thick for [slip-in or flanged] mounting. <Edit for Project Requirements>

- I. Casing: Coil casing and endplate shall be fabricated from Galvanized steel, as a standard construction, meeting ASTM and UL G90U requirements, Aluminum, 0.080 inch thick, optional, Copper, 0.063 inch thick, optional, 16 gauge or 14 gauge carbon steel or stainless steel, optional. Double flange casing shall be provided when coils are specified as vertical stacking. Standard coil intermediate tube sheets (center tube supports) shall be fabricated from the same gauge sheet stock and material as the end plates, and to the following schedule:
- J. Header Connections: Standard construction fluid connections are male pipe thread (MPT) and constructed from red brass conforming to ASTM B43 or Schedule 40 steel pipe as a minimum.
- K. Cleaning: All residual manufacturing oils and solid contaminants are removed internally and externally by completely submersing the coil in an environmentally and safety approved type degreasing solution, which is also chemically compatible with the coil material. This may vary for steel tube coils, depending on the application and/or customer specifications.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine ducts, plenums, and casings to receive air coils for compliance with requirements for installation tolerances and other conditions affecting coil performance.
- B. Examine roughing in for piping systems to verify actual locations of piping connections before coil installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 INSTALLATION**

- A. Install coils level and plumb in accordance with manufacturer's instructions.
- B. Install coils in metal ducts and casings constructed according to SMACNA's "HVAC Duct Construction Standards, Metal and Flexible."
- C. Straighten bent fins on air coils.
- D. Clean coils using materials and methods recommended in writing by manufacturers, and clean inside of casings and enclosures to remove dust and debris.

#### **3.3 CONNECTIONS**

- A. Piping installation requirements are specified in other Division 23 Specification Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

- B. Install piping adjacent to coils to allow service and maintenance.
- C. Connect system piping to coil connections with threaded pipe flanges. Where header connections are red brass, provide dielectric connections at system pipe connections. See Division 23 Specification Section for "HVAC Piping Systems and Specialties" for dielectric connection requirements.
- D. Provide shutoff valves were indicated on details to allow coils to be disconnected without draining piping. Shut off valves and other piping specialties are specified in Division 23 Specification Section "Valves for HVAC Piping Systems."
- E. Control valves are specified in Division 23 Specification Section "Control Valves and Dampers."

END OF SECTION 238216