

SECTION 15790

AIR COILS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Hydronic Coils.
2. Steam Coils.
3. Direct-Expansion Refrigerant Coils.

B. Related Sections:

1. Section 15010 - Basic Mechanical Requirements.
2. Section 15511 - Hydronic Piping and Specialties.
3. Section 15521 - Steam and Condensate Piping and Specialties.
4. Section 15531 - Refrigerant Piping and Specialties
5. Section 15548 - HVAC Water Treatment
6. Section 15650 - Refrigeration
7. Section 15835 - Electric Heat: Electric Heating Coils in Ductwork.
8. Section 15855 - Air Handling Unit with Coils.

1.02 REFERENCES

- A. Air-Conditioning and Refrigeration Institute (ARI)

1.03 SYSTEM DESCRIPTION

A. Design Requirements:

1. General:

- a. Except where special design requirements might dictate, coils shall have copper tubes with aluminum fins, permanently bonded.
- b. Provide access areas on inlet and discharge sides of coils for maintenance purposes.
- c. Provide for coil pull space and specify full track support for easy installation and

service.

- d. Specify all water coils to be drainable type.
- e. Provide drain piping and air venting at all water coils.
- f. Specify all coil ratings to be ARI Standard 410 certified.
- g. Specify fin spacing to be 12 fins per inch or less unless otherwise indicated.
- h. As a measure to improve indoor air quality as per ASHRAE 62-1989: Coil drain pans and drip troughs at the bottom of coils should be designed to slope to drain to minimize standing water in the air handling unit, plenum, etc. (Stagnant water is prime habitat for microorganisms.)
- i. Specify working pressures and temperatures for coils. Be sure to allow for the static head that a coil will see due to the height of the building.
- j. Specify type and percent of glycol in water.
- k. Provide good mixing of return and outside air streams upstream of coil to minimize stratification and possible coil freeze-up.
- l. Provide flexibility in piping where connected to the coil if the coil is not isolated from fan or other vibrating equipment.
- m. Design all units for 6400 feet above sea level.

2. Chilled Water Coils:

- a. Design for full counter-flow of water and air with water inlet at the bottom of the supply header and outlet at the top of the return header.
- b. Specify stainless-steel frames and blank-off spacers between coil frame and housing. Use stainless-steel hardware to fasten blank-offs and frame.

3. Direct-Expansion Refrigerant Coils:

- a. Direct expansion coils may be used on small systems and shall be piped and installed in accordance with factory recommendations.
- b. Additional design precautions shall be taken, or a field refinement procedure shall be included in the specifications, on those installations not covered by the manufacturer's guide.
- c. Specify full face active coils in applications involving variable airflow thru the coils such as multi-zone or VAV systems.
- d. Specify face split coils for constant volume or where humidity control is required.

4. Hot Water Coils:

- a. Standard construction.

5. Steam Coils:

1. All steam coils to be of the Centri-Feed type
2. All steam coils to be horizontal flow with sloped tubes
3. Tubes to be a minimum of 12 gauge carbon steel
4. Fins to be a minimum .020 thick aluminum (imbedded type)
5. Header to be a minimum schedule 40 carbon steel pipe
6. Connections to be a minimum schedule 80 carbon steel pipe
7. Casing to be a minimum 14 gauge galvanized steel
8. Tubes, headers, and connections shall be welded together to form monometallic joints.

Approved Manufactures:

1. Need pre-approval
6. Where coils are exposed to all outside air, use steam preheat coils, with face and by pass dampers to allow full flow of heating medium at or below freezing conditions (with modulation of steam flow above freezing). Downstream coils, if required, can then be modulated to provide desired supply air temperature.

7. Coils in built-up plenums:

- a. When cooling coils are stacked one above the other, design and specify drip troughs on the downstream side of each of the upper coils to eliminate drip into the air stream of the bottom coil. Drip troughs shall slope to drain as noted above.
- b. Condensate drain piping should incorporate a P-trap with the height of its water seal correctly sized to prevent trap from being sucked or blown dry by the static pressure differential between the inside and outside of air handling unit.

1.04 QUALITY ASSURANCE

- A. All coils shall be certified by the manufacturer to comply with all requirements of ARI Standard 410.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Aerofin
Airtherm
Carrier
Dunham-Bush
Heatcraft
McQuay
Pace
Rosemex

Temtrol
Trane
Wing
York

PART 3 - EXECUTION

3.01 INSTALLATION

- A. In general, for project specifications, remove "Design Requirements" sub-paragraph A in Part 1, paragraph 1.03 "System Description" of this Design Guide and use list to expand on specific requirements of installation/application for each product specified.
- B. Steam Coil Installation:
1. Support coils and piping individually to prevent undue strains on the steam and condensate connections.
 2. Install a drip trap prior to the coils (and before the control valve) on installation where the steam main is higher than the control valve or the control valve is more than 5' from the steam main.
 3. Install strainers with blowdown valves before all control valves and traps.
 4. Install a vacuum breaker in the steam piping prior to the coil and on the downstream side of the coil before the trap.
 5. Trap all coils individually. Locate trap as close as possible.
 6. Install only inverted bucket traps with large vent buckets on any coil that will see temperatures below 32 degrees F.
 7. Install a dirt pocket prior to the steam trap.
 8. All condensate to be gravity drained.
 9. See Appendix A: Typical piping for steam coil.
- C. Trap Sizing:
1. Modulating:
 - 0-15 psi steam pressure- use a 2 to 1 safety factor at a .5psi differential
 - 16-30 psi steam pressure-use a 2 to 1 safety factor at a 2 psi differential
 - above 30 psi steam pressure-use a 3 to 1 safety factor at ½ of maximum differential
 2. Constant pressure:
 - Use a 3 to 1 safety factor at operating pressure differentials.

END OF SECTION