**Steam Coil Specifications**

**1.1 General**

Steam distributing coils should be used for applications where freeze protection is a concern, and air temperatures are below 40°F. Supply steam pressure for steam distributing coils should be a minimum of 5 PSIG for proper operation and freeze protection. Modulating control valves should be used with steam distributing coils. Non-distributing coils should be used only with on-off control valves.

**1.2 Certification**

All steam coils are to be AHRI performance certified and bear the AHRI symbol. Coils outside the scope of AHRI’s standard rating conditions or the manufacturer’s certification program will be acceptable since the manufacturer is a current member of the AHRI coil certification program, and all coils will be rated in accordance with AHRI Standard 410.

**1.3 Tubes**

Tubes and return bends are to be constructed from seamless UNS C12200 copper conforming to ASTM B75 and ASTM B743. Properties shall be O50 light annealed, with a maximum grain size of 0.040mm.

Seamless tubes are to be mechanically expanded into plate fins for maximum heat transfer. Minimum wall thickness: .025 for performance longevity.

**Standard Tubes:**

(Standard Steam and Steam Distributing)

5/8” O.D. x .025” standard wall thickness (.035”, .049” optional)

with 3/8” O.D. inner seamless copper distributing tube for steam distributing coils.

(Steam Distributing Only)

1” O.D. x .035” standard wall thickness (.049” optional)

with 5/8” O.D. inner seamless copper distributing tube for steam distributing coils.

**Optional Tube Materials – O.D. options vary:**

Stainless Steel

Cupro-Nickel

Carbon Steel

**1.4 Fins**

Secondary surface (fins) are of the plate-fin design using aluminum or copper, with die-formed collars. The fin design is to be flat, waffle, or sinewave in a staggered tube pattern to meet performance requirements.

Collars will hold fin spacing at specified density and cover the entire tube surface. Aluminum properties are to be Alloy 1100 per ASTM B209, with O (soft) temper; copper is to be Alloy 11000 per ASTM B152-06 with soft (anneal) temper. Fins are to be free of oils and oxidations.

**1.4 Fins Continued**

**Standard Steam and Steam Distributing Coils:**

Aluminum fin with 5/8” O.D. tube - .006” fin thickness (.0075”, .010” optional)

**Steam Distributing Coils:**

Aluminum fin with 1” O.D. tube - .010” fin thickness

**Optional Fin Materials:**

Copper Stainless Steel

**1.5 Headers**

Headers are constructed of seamless UNS C12200, Type L copper material sized to match specified connection size. Headers for steam distributing coils shall have die-formed end caps brazed on the inside of the headers. Headers for standard steam coils shall have finished integral spin-closed ends.

All end closures are designed to withstand test pressure.

**Optional Materials:**

Carbon steel headers

Stainless steel headers

Cupro nickel headers

**1.6 Connections**

Connection material can be copper, steel, or red brass pipe. The type of connection is to be sweat type, MPT or FPT, grooved, or flanged as required.

Connections will be sized to accommodate supply steam and condensate loads. Steam distributing coil connection locations shall be such that steam is distributed adequately among all tubes, and that condensate is removed from all tubes to insure freeze protection.

**1.7 Casing**

Coil casing material shall be 16-gauge, G90 galvanized steel. Heavier gauge and optional material casings are available as required to meet specification.

All tube sheet holes are to be oversized to allow for free thermal expansion and contraction of tubes during operation. Intermediate tube supports are to be provided on all coils 50” and longer in fin length. Coil casings on top and bottom of coils are to have double-flanged construction, allowing for vertical stacking of coils.

**Standard:**

16-gauge galvanized steel

**1.7 Casing Continued**

**Optional Casing Materials:**

12, 14, & 18-gauge galvanized steel

12, 14 & 16-gauge 304 stainless steel

12, 14 & 16-gauge 316 stainless steel

14-gauge aluminum

**1.8 Brazing**

All coils are to be brazed with minimum 5% silver content (BCup-3) filler material to ensure joint integrity. Low-fuming, flux-coated bronze braze-weld material is to be used for ferrous to non-ferrous joints.

**1.9 Pressure Testing**

Coils shall be tested at 550 PSIG using dry nitrogen, submerged under water. Dual-operator verification shall determine that all coils are leak-free.

**1.10 Operating Pressures and Temperatures**

Steam coils shall be designed to withstand 150 PSIG saturated steam supply pressures with appropriate wall thickness and guaranteed up to 400° F working temperature.

**1.11 Crating**

Coils shipped outside of an air handler are a very vulnerable commodity and require a custom design for each shipment. Any crate should include a full wood pallet and wood crate frame. Crate frames shall have intermediate framing on longer crates. Crates over 750 lbs. should be banded as well. All horizontal boards protecting the fin surface, the headers, and the bends shall be heavy wood. The use of cardboard or other light materials is not acceptable. Internal blocking using heavy wood boards should be strategically placed to not allow movement of coils inside the crate. Manufacturer shall submit a special crate drawing and specifications for the coils to be furnished on this project, for approval, that clearly show adherence to this crating specification.

**1.12 Installation**

Coils are to be installed according to manufacturer’s instructions and applicable piping codes. Piping systems shall be designed to allow for proper supply steam to coils, and condensate removal from coils.

Contact **USA Coil and Air, Inc.** for specifications concerning other materials of construction.

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