**Fluid Coil Specifications**

**1.1 General**

USA Coil & Air fluid coils are intended for use with water, glycol, or other appropriate heat transfer fluids. Coils are to be designed to maximize performance under specified conditions with minimal air-side pressure drop. All coils shall be constructed with plate fins and seamless tube construction as shown on plans and specifications.

**1.2 Certification**

All water coils designed with 1/2” or 5/8” tubes are to be AHRI performance certified and bear the AHRI symbol. Coils outside the scope of the 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 coils will be rated in accordance with AHRI Standard 410.

**1.3 Tubes**

Tubes and return bends shall 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.

**Standard:**

 3/8” O.D. x .014” standard wall thickness (.016”, .022” optional)

 1/2” O.D. x .016” standard wall thickness (.025” optional)

 5/8” O.D. x .020” standard wall thickness (.025”, .035”, .049" optional)

**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.

**Standard:**

Aluminum fin with 3/8” O.D. tube - .006” fin thickness (.0075” optional)

Aluminum fin with 1/2” O.D. tube - .006” fin thickness (.0075”, .010” optional)

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

**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 are to have finished integral spin-closed ends designed to withstand test pressure. 1/4” vents and drains are provided for al fluid coils unless specified otherwise.

**Optional Materials:**

Carbon steel headers

Stainless steel headers

Cupro nickel headers

**1.6 Connections**

Connection material can be copper, schedule 40 steel, or red brass pipe. The type of connection is to be sweat type, MPT or FPT, grooved, or flanged as required.

**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. 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

**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 insure joint 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 comprised of round tubes shall be tested at 550 PSIG using dry nitrogen while submerged under water. Dual-operator verification determines that all coils are leak-free.

Sectional and cleanable coils designed with removeable sections shall be leak tested at 150 PSIG with recommended operating pressure of 100 PSIG, and max operating temperature of 160°F.

**1.10 Operating Pressure and Temperatures**

Fluid coils shall be designed for 390+ PSIG water operating pressure (based on tube and header O.D.) and guaranteed up to 200° 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.

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

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