**Condenser Coil Specifications**

**1.1 General**

USA Coil & Air condenser coils are intended for use with a wide range of applications and refrigerant types. Coils are to be designed to maximize performance under specified conditions with minimal air-side pressure drop.

**1.2 Certification**

Coils shall be UL recognized as Refrigerant Containing Component. Coils to be used with refrigerant R-410A shall have undergone cycle testing and shall be listed up to 750 PSIG rating.

**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” diameter x .014” wall thickness (.016”, .022” optional)

 1/2" diameter x .016” wall thickness (.025” optional)

 5/8” diameter x .020” wall thickness (.025”, .035”, .049” optional)

 **Optional:**

 Internally enhanced rifled tubes can be offered as an option with 3/8” and 1/2” tubes.

**1.4 Fins**

Secondary surface (fins) are of the plate-fin design using aluminum or copper, with die-formed collars. The fin design for 5/8” & 1/2” O.D. tubes is to be flat, waffle, or sinewave in a staggered tube pattern to meet performance requirements. The fin design for 3/8” O.D. tubes is to be flat, louvered, 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 Material:**

Copper

**1.5 Headers**

Headers are to be 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.

**1.6 Connections**

Condenser coils shall be designed with copper sweat connections and shall be shipped with caps on the connections.

**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. Coils designed for hot-gas applications shall have oversized tube sheet holes for hot gas feeds to allow for free expansion and contraction of tubes during operation.

Intermediate tube supports are to be provided on all coils 50” and longer 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 ensure joint integrity.

**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. Coils shall be shipped with nitrogen charge to verify leak-free integrity and to prevent moisture migration into the coil.

**1.10 Operating Pressures**

Coils shall be certified to withstand up to 750 PSIG working pressures.

**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.

 System piping and risers shall be designed for velocities that allow for proper oil return throughout the system.

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

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