**Sentry Guard™ Burst Resistant Coil Specifications**

**1.1 General**

All coils shall be constructed with plate fins and seamless tube construction as shown on plans and specifications. They are intended for Water or Steam or other appropriate transfer fluids. They are designed for maximum performance under specified conditions with minimal air-side pressure drop.

**1.2 Certification**

Sentry Guard coils are designed to conform with AHRI Standard 410. 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 Tubing**

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.

**Fluid Coil Tubes:**

1/2” O.D. x 0.016 standard wall thickness (.025” optional)

 5/8” O.D. x 0.020 standard wall thickness (.025”, .035”, .049” optional)

**Steam Coil Tubes:**

(Standard Steam & Steam Distributing)

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

(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.

**Return Bends:**

.035” standard wall thickness on all Sentry Guard return bends.

**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.

**Fluid Coils:**

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)

**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

**1.5 Headers**

Headers (manifolds), if required, shall be constructed of round pipe type and shall be constructed of a minimum of .060” wall seamless copper. End caps shall be rounded to prevent excessive pressure drop. All coils shall be provided with proper vent and drain connections.

**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 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.

**1.8 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

**1.9 Freeze Relief**

All coils shall be furnished with special **Sentry Guard™** freeze relief plugs/ caps as applicable. These special fittings shall be of a unique design with a specific copper membrane set in place by a brass washer and crimped into the seat. This screw-on, screw-off removable plug/cap shall be designed to relieve pressure at 650 PSI, which is well below the tubing burst pressure rating. They shall be on all return bends on both sides of the coil, on applicable headers and tube ends as required. A minimum of (5) spare relief plugs on a steam coil and (10) spare plugs on a water coil shall be supplied with each coil. Use of intermediate headers and pressure-sensitive valves on one or both ends will not be an approved method for relief and freeze protection.

**1.10 Pressure Testing**

All coils shall be leak tested at 300 PSIG dry nitrogen pressure submerged under water. Dual-operator verification shall determine that all coils are leak-free.

**1.11 Operating Pressures and Temperatures**

Fluid coils shall be designed for 390+ PSIG water operating pressure (based on tube and header O.D.). Steam coils shall be designed for 150 PSIG steam operating pressure. Fluid coils are guaranteed up to 200°F working temperature. Steam coils are guaranteed up to 400°F working temperature.

**1.12** **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.

**1.13 Warranty**

All Sentry Guard™ coils shall be guaranteed against freeze damage, except for freeze plugs/caps, for a period of 30 months from date of shipment. Coils also have a standard (12) month material and workmanship warranty. (Please review Sentry Guard™ limited warranty for full details)

**1.14 Installation**

Coils are to be installed according to the manufacturer’s instructions and applicable piping codes.

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

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