



Coil Company News

HVAC COILS • SPACE COOLERS • AIR HANDLING EQUIPMENT

Issue 4 – August 2005

The Process of Building Coils

Most H.V.A.C people aren't familiar with how coils are built. They know how they work, and they know how to size them, but the actual process of building a coil is not something that they have ever seen.

We can't take you to one of our plants to show you our manufacturing process, but we can explain it to you, so that you can understand this process.

Fins

Fins are responsible for up to 70% of the heat transfer process on any coil, so as you can imagine, manufacturing fins is critical. Coil Company has several fin dies that cut the fins to the proper height, and depth, based on the fin height and row depth. The fin die also does (4) other things when stamping out the fins:

- 1 The edges of all fins are not straight. The leading edge of the fin is rippled to break up the air as it hits the fin.
- 2 The fin is not flat. It is corrugated to make the air bounce back and forth as the air passes through the coil from front to back (V-waffle).
- 3 Tube diameter holes are punched through the fins to match the tube diameter and the number of tubes that will be connected to the fin.
- 4 A fin collar is produced when the tube hole is punched. This fin collar is extruded off the hole, and is used to both space fins from each other, and is also the connection point between the tubes and fins when the tube is inserted into the fins. Because 14 fins/inch is a closer fin spacing than 8 fins/inch, the fin collars are not as wide, and the fins can be slid onto the tubes closer to allow for more fins/inch.

A chilled water coil with 14 fins/inch that is 120" long has a total of 1,680 fins. All of these fins are cut at the same time and are identical to each other. The proper number of tubes are placed in a rack, and all 1,680 fins are slid onto the tubes, and are pressed tight against each other so that each fin is snug against the fin collar of the previous fin.

Expansion

At this point the tubes and fins begin to look a little bit like a coil, except fins are still loose on the tubes. In order to gain effective heat transfer, a bond must be created between the tubes and fins. An expansion ball is sent through the tubes and actually expands the tube into the fins. This process can also be done hydraulically rather than with a ball. The O.D. of the tube is expanded so that the diameter of the tube is .008 to .010 inches bigger than the I.D. of each fin connected to the tube. This expansion process creates a bond between the tube and fin that allows up to 70% of all heat transfer to take place. It is possible to over-expand and the tube wall thickness becomes too thin when this happens. It's a delicate balance to expand the tube properly to make it the right outside diameter, and keep the wall thickness uniform throughout the length of the tube.

Casing

The tubesheets and casing are installed around the coil to keep this large and heavy fin/tube core together. The casing and tube supports structurally support the fin/tube pack. The casing is generally 16 Ga. or 14 Ga. galvanized steel.

This Issue

The Process of Building Coils.....pg 1&2

Stock Hot Water Booster Coils.....pg 2

Coil Company, LLC.

3223 Phoenixville Pike, Malvern, PA 19355

Toll-Free: 800.523.7590 • Phone: 610.251.0257 • Fax: 610.251.0805

Email: sales@coilcompany.com • Web: www.coilcompany.com

The Process of Building Coils

continued from page 1

Brazing or Welding

All return bends and manifolds must now be brazed or welded to the tubes, depending on the materials. Also, connection stubs must be attached to the manifolds. The coil is now fully built.

Testing

Every coil is tested for leaks. Each coil is dropped into a tank of water and all connections are blocked off. A compressor is hooked up and the coil is leak tested at 400 P.S.I.G. (sometimes higher for industrial coils). The coil is left in the tank for up to 10 minutes to identify any leaks. It's similar to testing a tire for leaks under water. Any leaks in the brazing are identified, marked and repaired. The coil is again tested and will pass or fail.

Crating

It doesn't do any good to build a great quality coil with a high degree of quality control, if you're going to be cheap when building the crate. All this does is encourage freight damage, and you're left with a coil that doesn't work. Crating on all coils should be heavy wood with very little or no cardboard. Coils should be "blocked" inside the crate to allow for very little movement.

We hope this helps you better understand how we build coils at Coil Company. This process is not drastically different than at Carrier, Trane or McQuay or at any coil manufacturer. We just think that it's important for our customers to know how it's done.

Coil Company can build either 3/8", 1/2", 5/8" or 1" coils, because we have the fin dies to produce any of these tube diameter coils. We are not limited to tube diameter, fin spacing, circuiting or any of the other limitations imposed by other manufacturers. Coil Company doesn't have to build large quantities of any coil. Just call us and give us the proper information, and Coil Company will build the coil that you need.

Stock

Hot Water Booster Coils



*Hot Water Booster Coils
sized from 6" x 12" to 30" x 60",
shipped from stock in 1 day.*

Replacement Hot Water Booster Coils, Shipped from Stock in 1 day to 3 days

It seems there's never a convenient time to install hot water duct coils. When it's time you know it, and you know you need to install them fast, with a quality coil specified for your application.

Coil Company consistently ships a broad range of hot water duct coils, and applying our combined experience of more than 75 years we'll make sure the coil suits the specifications of your application.

- 1 and 2 row coils in 33 different sizes from 6" X 12" to 30" X 60"
- Flanged or Slip & Drive

**For all your coil needs,
technical information or questions, call our toll-free number
800-523-7590**



Coil Company, LLC.

3223 Phoenixville Pike, Malvern, PA 19355
Toll-Free: 800.523.7590 • Phone: 610.251.0257 • Fax: 610.251.0805
Email: sales@coilcompany.com • Web: www.coilcompany.com