



# Coil Company News

HVAC COILS • SPACE COOLERS • AIR HANDLING EQUIPMENT

Issue 16

## Erosion vs. Corrosion

Steam does both — treat each one differently.

### Coil Company's Quick Ship Program

#### Standard Ship

Almost all coils ship in 4-5 weeks as standard. There are some exceptions, based on special materials, but 95% of all coils will ship in 4-5 weeks with no premium.

#### 10 Work Day Ship

Most coils can ship in 10 work days (2 weeks) for a premium of 20% based on the size of the job. We guarantee that the coil will ship on time or you don't pay the additional premium.

#### 5 Work Day Ship

For major coil emergencies, you can have your coil ship in 5 work days (1 week). The required premium for this shipment is 40%. We guarantee shipment or you don't pay the premium.

### This Issue

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*It's time for everybody to turn on their steam systems around the country, and we all know that we'll be replacing steam coils pretty soon. It's a "tradition" at Coil Company. The steam goes on, the coils fail, and Coil Company gets the replacement business. There are ways to eliminate replacing steam coils, but it requires a little preventative maintenance, a little design engineering, and an understanding of how steam coils work. So, that's what this Coil Company Newsletter will be devoted to. We're going to give you as much good information on steam coils as we can!*

### Erosion VS. Corrosion

Steam is almost always erosive and sometimes it's corrosive, but there is a difference. Many HVAC systems contain low pressure steam coils at 5-10 PSIG. Does that mean that the steam boiler is actually producing low pressure steam? Probably not! Usually steam is produced at 100-200 PSIG with reducers at many points in the system. The reason is that 100 PSIG steam is much more erosive than 50 PSIG steam, and so on right down the line. The higher pressure steam that you use to supply a coil will shorten the life of the coil considerably, or you have to "beef-up" the construction of the coil to handle the higher pressure. This is also true of piping, valves, etc. So, the idea is to provide low pressure steam to the coil to make the system last longer. That's why the majority of systems reduce the steam to low pressure. You must design and build the coil, based on steam pressure, and how erosive the steam is.

Steam can also be corrosive, if it isn't treated properly. There are lots of systems where steam is corrosive and eats away at the brazing, return bends, etc. The problem is that it's very easy to confuse erosive vs. corrosion. All you can determine is that the coil is failing, and it has to be replaced.

### Materials/Construction

When you are dealing with erosive steam, your strategy should be to build a "beefed-up" coil. Normal tubes are 5/8" O.D. with a wall thickness of .025". When you feed a coil with 50 PSIG or 100 PSIG steam, you must still use a 5/8" O.D. tube, but increase the wall thickness to .035" or .049". You must also use a higher percentage of silver in the brazing process. If you feed a coil with steam above 100 PSIG, it's advisable to go to 90/10 cupro-nickel which still has great heat transfer properties, but exhibits a lot of the properties of stainless steel. It's still a brazed coil, but a lot more resistant to erosive steam.

Corrosion is handled differently. If you just increase wall thickness, you don't really solve the problem. Corrosion still takes place, and the coil might last 2 weeks longer, but you get coil failure anyway. You have to select and change the materials of construction to a material which is resistant to whatever corrosive agent that you're dealing with. Sometimes 304/316 stainless is okay, or sometimes 90/10 cupro-nickel is okay. The point is that you have to treat erosion and corrosion differently. Then there is the "Daily Double" where you have both corrosion (on the inside or outside of the coil) and high pressure erosive steam present. You really have to design the coil so you meet all conditions. It's not always easy, but it can be done!

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## Erosion VS. Corrosion

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Steam Coil

### Traps, Vacuum Breakers, Etc.

Any time you leave condensate trapped in a coil, you will have problems. Condensate prevents the steam from flowing through the coil uniformly and you don't get effective heat transfer. There are "dead spots" across the face of the coil, and "water hammer" can take place in the tubes and headers. Basically, it's just not a very good situation.

That's why steam coils are so dependent on the system that they are installed in. You have to install the right kind of trap, and install it in the proper position. You need vacuum breakers in most systems, and every steam coil must be pitched to allow the condensate to escape. Lines must be insulated properly, and in addition, there are strict guidelines for how to lay out these systems.

What you really need to do is make sure that any steam coil is properly evacuated of condensate. It will always cause a coil to operate improperly, and most of the time cause premature failure.

### Tube Diameter

Standard steam coils come in one diameter only - 5/8" O.D. Steam Distributing coils come in two choices — either 5/8" O.D. or 1" O.D. Because there is an inner distributing tube inside these coils, condensate flow can be impeded or stopped when the tube is too small. Whenever you have a lot of outside air passing across a Steam Distributing coil, then always use a 1" tube diameter. You will have higher condensate load in lbs./hour and the 1" O.D. tube gives you enough room to get the condensate out of the coil. It's a little more expensive, but necessary!

It's important to keep these things in mind when laying out jobs or specifying coils of any type. This information is also true for steam coils inside air handlers.

***Still have questions — call Coil Company at 800-523-7590. We'll walk you through it and make you feel comfortable with the whole process.***

## Stock Hot Water Booster Coils



*Hot Water Booster Coils  
sized from 6" x 12" to 30" x 60",  
shipped from stock in 1-3 days.*

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### 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**



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