

# USA COIL & AIR NEWSLETTER

## **Why Do Coils Fail?**

Coils invariably fail for one of three different reasons:

- (1) Coils die of "old age". This is, obviously, the best reason, because it means that the coil was designed properly, and lasted a decade or two.
- (2) Coils freeze. It's easy to freeze just about any coil. This is not such a good reason, because you can freeze a coil two months after installation.
- (3) Coils are misapplied by the designer or contractor or manufacturer. This is probably the "big secret" of the industry. Nobody wants to admit to it, but it happens all the time.

Let's take a look at these three scenarios, one at a time.

## **Old Age**

One of our favorite questions is "How long does a coil last?" The answer to this can be almost anything from 366 days (1 day over the warranty) to 30 years. It depends on so many factors. Is the air clean? Is the water or steam clean? Is the coil ever cleaned or maintained properly? It's an almost unanswerable question, but one everybody likes to ask. So, we at USA, have come up with an answer, and the answer is 15 years. It could be 10 years, or it could 20 years, and we wouldn't quarrel with any number that was given. The point is that there is no "hard and fast" answer to this question, and once your coil begins to fail because it's old, then it's time to replace it. (You can use 15 years also, if that's the answer you like too.)

Over time, erosion takes place within a coil at the tubes, manifolds and joints. Steam is more erosive than water, but erosion takes place in all coils. In addition, fins become loose on the tubes and efficiency decreases. Also, coils make great filters! When there is little maintenance done, or when filters are not changed properly, then you can count on your coil acting just like a filter. None of this is any good for a coil and causes coils to fail prematurely.

When coils begin to "wear out", you get pinhole leaks in multiple places. You can postpone replacement for weeks or even a couple of months, but not much beyond that. You can give the coil a quick fix by "blocking a tube" or taking tubes out of the circuiting. You can braze over a leak. None of this is going to make a long-term difference, because the coil is just "passing away from old age". Save yourself a lot of aggravation and pain and just replace the coil.

## **Freeze - ups**

As we've mentioned in previous newsletters, any coil can freeze at any given time, based on the wrong set of conditions. If you have a coil, and it's been in service for 6 months and you freeze it in one or two places, then it's probably repairable. You can braze it or block it and the rest of the coil will operate with little or no problem. It is possible, however, to freeze the same coil in 15 different places, and you should just pronounce "last rites", over the thing and replace it immediately. You're wasting your time trying to do anything but give it a temporary fix. When coils freeze, the fractures at the tubes are longer than pinhole leaks, and run the length of the tube rather than around the tube. They are very distinct and easy to spot. Coils don't freeze the way that you think they do. It's not really the ice that causes the bulge in the tubes, and ultimately the fracture or leak. Freezing takes place within a tube at several places simultaneously, and pressure builds up between the freeze points. It's this pressure that causes the tube to bulge and break. Pressures range from 1,000 P.S.I.G. (return bends break) to 2,000 P.S.I.G (tubes & manifolds break). Trust us when we tell you that at these pressures, you will do some serious, long-lasting damage to coils.

## **Misapplication**

It's very common to have a coil that was never designed properly in a system. Sometimes the coil is not designed for the performance, and sometimes the coil is not designed for the duty. Usually, the reason for a shortcut in coil design is money. Either the contractor or somebody needed to save a few bucks. The user, however, is stuck trying to make a coil operate properly when there are obvious problems with the coil and the system. Does the coil need to be replaced? That depends on how much nonsense the user is willing to put up with, and how critical the coil is to the operation of the facility. Fully 25% of the coils that USA replaces are because the coil was either built incorrectly, or was never designed properly in the first place.

Most coil replacements involve some kind of problem-solving. You don't want to duplicate the problem that caused the coil to fail. That's where USA comes in handy. Over the years, we've built a lot of replacement coils for a lot of customers. We've seen most of the problems that cause coils to fail., and we're pretty good at diagnosing them. Call Brian Cosgrove at 800-872-2645, and, he'll walk you through any replacement job that you have.



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