the NEWS

A New Solution Found for Dirty Sock Syndrome

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Coils that fall victim to Dirty Sock Syndrome come in all shapes and sizes and not always with a common reason for the strange occurrence.

[Editor's note: A long-time, passionate advocate of the HVAC industry, David Debien, is quoted in this article. Debien passed away in January. This article is one of many that he contributed to for the betterment of this industry. Rest well, David Debien.]

"They call it â€˜Dirty Sock' syndrome because that's what it smells like, just like a gym locker," said David Debien, owner of Central City Air in Houston and known throughout the country as an air conditioning guru.

"It started showing up 10 or 12 years ago and it has been a difficult problem to solve. We thought it only occurred in the hot and humid climates of the South, but recently a contractor in Boston reported a case. It's getting worse every year. Ten years ago we had one or two cases a year. Last year we had 20 cases at our business alone."

No one seems to know for sure what causes it, but nearly everyone agrees it is likely bacteria related. It is thought to be a precipitate on the indoor evaporator. Often Dirty Sock Syndrome (DSS) shows up after an old evaporator coil has been replaced. The building environment also contributes to the syndrome.

Airtron is a network of 15 HVAC contractor offices spread through the Midwest and South and has a lot of first-hand experience dealing with the syndrome. In a white paper on the Website of their San Antonio office, they discuss the difficulties involved in dealing with the problem:

"The Dirty Sock Syndrome plagues half to 2 percent of heat pumps in the Southern states with Texas representing the lower side of the percentage. The syndrome is not brand specific, with all manufacturers acknowledging complaints. The problem itself is sporadic and limited to isolated households and is somehow related to living style or products in the home. This can be proven as manufacturers have documented changing out systems with new product and the complaint returns.

"After removing a â€˜stinky' unit from a complainant's house, the unit can be cleaned and installed elsewhere without a complaint surfacing. Changing the brand of equipment has met with similar unsuccessful examples. In one instance, a complaining couple underwent a divorce and when one of them moved out of the home, the problem went away. Much effort and expense has been given by this industry to research and to solve this syndrome."

The problem seems to be limited to heat pumps. In most gas-fired furnaces, the coil temperatures exceed 160°F, a temperature that would kill most microbial life. But in heat pumps, the typical coil temperatures during heating cycles is between 120 and 130°, a temperature that seems ideal for the supposed microorganism to thrive.

And what does heating have to do with a problem that is usually blamed on air conditioning?

"It's a problem unique to very hot, very humid conditions," said Debien. "In the winter in Houston, many days you'll need heat when you wake up in the morning, but by afternoon the air conditioner will be on. It's this short cycle of hot and cold that provides the perfect environment for the germs to prosper. But why did it suddenly appear when it hadn't happened before? I have a theory, with no way to prove it. Dirty Sock started appearing just about the time OEMs started using recycled aluminum in their coils instead of virgin. The belief is that the recycled is more porous and provides a kind of petri dish for bacteria growth."

WHAT TO DO ABOUT IT?

That's the million dollar question. A lot of things have been tried. Some have worked for a while, but the dirty sock smell usually makes its way back. There has not been one tried and true method. The odor always seems to find its way back - often two times a year. And no matter who is at fault, it's the contractor who must take responsibility.
The more drastic solution has been to coat the coil. One manufacturer recommends coating coils with a mold preventative, but, since the problem is generally thought to be bacterial, it's difficult to see how that will help.

Coil coating is an expensive and time-consuming process. Since the coil must be removed from the system and shipped to a manufacturer of a coating service, the system is down for some time. In places like Houston that is not a welcome choice. And success with coated coils has also been limited.

A BATTLE WITH DIRTY SOCK

Debien had been fighting a personal battle with Dirty Sock Syndrome for the last decade and was determined to beat it.
"I'm a fanatic about HVAC. My wife says I not only talk about it day and night, I also talk about it in my sleep. And the steady increase of incidents every year made it even more important. We are completely determined to give our clients the very best systems and service that is humanly possible, and Dirty Sock was making that very difficult."

One of Debien's first-time clients was a Houston-area resident named Vince Richards. He and his wife had just bought a house and they soon noticed a powerful odor. The previous owners had had an air conditioning company clean the coils so they called that company. They recommended using ultraviolet light to kill bacteria.

"The problem was," said Richards, "that it didn't work. The smell came back. The smell was so bad we had to open all the doors and windows to air the house out. Since it always occurred after a heat cycle, we eventually stopped using the heat.

"I found out that it was called Dirty Sock Syndrome and went on the Internet to find a solution. On one site, someone e-mailed me back that I should check out Central City Air. First I e-mailed him and David e-mailed back and told me the only solution was to coat the coil. He sent a technician out to assess the problem.

The technician was very informative. He told me that in most new construction the lowest bid for HVAC won, meaning the system is the minimum to do the job. He also discovered that our heater was about to go. I didn't see any sense in beating a dead horse, so I asked Central City to do it right. It was an expensive proposition, but now I had a newly zoned system that worked.

"The technician said that that they had just started using a new coating material that contained a special antibacterial agent and carried a 10-year warranty. The best thing about the whole job is that the smell never came back. Oh, did I mention? My energy bill is way down with the new system."

"A lot of air conditioning contractors are going to ultraviolet (UV) to solve Dirty Sock because it kills mold, mildew, and bacteria," said Debien.

"Several manufacturers are also offering it as an option. But it isn't ideal. UV only kills what it can â€˜see' and, given the nature and shape of air conditioning coils, UV can't see everything. Even if you use two lamps, there are always nooks and crannies the light will miss; bacteria, mold, and mildew will grow. I know that we have found a better way."

THE SOLUTION TO SPECIAL COATINGS

That better way was the coating Debien used on Richard's coil in his new system. Debien had been so intent on defeating Dirty Sock Syndrome that he directed his key employees to look for a solution that

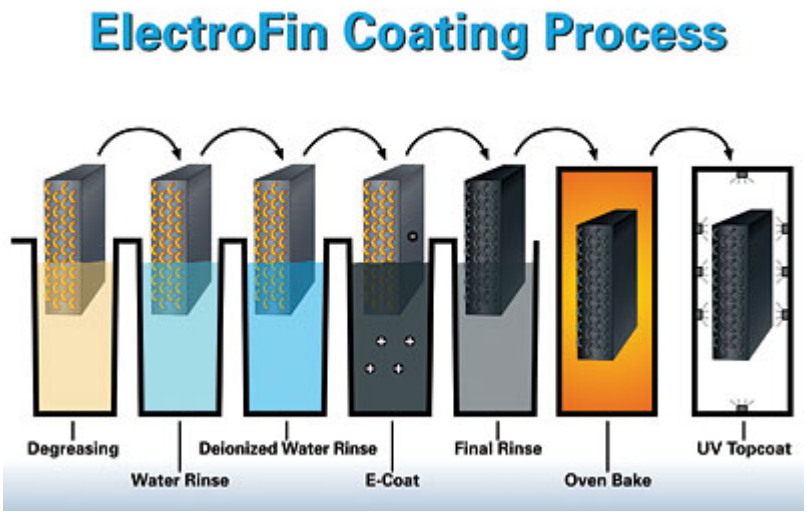
worked. After several dead ends, one of them found a company on the internet that claimed to manufacture a coil coating that was antibacterial and would end Dirty Sock Syndrome.
"I was skeptical at first," said Debien. "We had been disappointed before. But I noticed that this outfit was located in Florida and figured they must know something about Dirty Sock because their winters are a lot like ours."

The name of the company they took a chance with is Bronz-Glow of St. Augustine, Fla. They are a manufacturer of a range of industrial coatings and have one line that focuses on coil coatings for the HVAC industry.

"We shipped them a number of coils that had been suffering from Dirty Sock Syndrome and installed them back in the clients' homes," said Debien. "In every one of them the syndrome did not return, so we kept sending coils to Bronz-Glow. That was about a year and a half ago and after a while we concluded we had found the solution we'd been looking for."

It worked for every client they tried. Keith Hendricks had the coils replaced in two of his 15-year-old units and soon developed Dirty Sock, even though a third and older coil didn't have a problem.

"Central City coated those two coils," said Hendricks, "and the smell disappeared and never came back."



The process of the ElectroFin coating system provides an electrodeposition connection of the coil surface and the coating.

ELECTRODEPOSITION AS AN OPTION

Another coating solution is provided by AST Electrofin of Louisville, Ky. and Jacksonville, Texas. It involves electrodeposition of the coatings on the coils.
"This technology is particularly effective against bacterial problems," said Mike Powell, sales and marketing manager at AST ElectroFin. The coating is attracted to the metal surface one molecule at a time and gets into the tiniest openings, so every metallic surface gets coated. It also results in uniform thickness. The result is a coating consistently 1 mil thick."

As for the use of antibacterial additives, Powell sees some problems. "We're currently developing an antibacterial additive that will have EPA registration and will outlive the coil. We anticipate introducing it very soon."

So, for contractors doing business in a hot, humid environment and dealing with Dirty Sock Syndrome, there are some solutions available today with a new one on the way.

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