

Is UFAD All That It's Cracked Up To Be?



By Jack Webster

Keep your focus on a single fact: Not enough research has been done into UFAD installations.

It's dangerous to stand up to a tidal wave. A few savvy investors and investment advisors said the stock market was overvalued and due for a fall in 1998 and 1999. As the market wave's roar became deafening—NASDAQ's index rose 86% in 1999!—these folks were drowned out.

While they didn't change their tune, these men and women had no desire to become King Canute. They tired of shouting at the ocean!

...Then, of course, the wave (as is the case for all such waves) broke; the market collapsed. If it took a long time for the savvy to see themselves proved right, it took longer for the end game to play out. NASDAQ's index peaked (intra-day high) in March 2000 at the 5,132 level. And the low? October 2002, at 1,108.

Let's hope the hoopla over under-floor air distribution (UFAD) is peaking right now. We hear that UFAD is the be-all and end-all of the HVAC business. In fact, we are led to believe that

UFAD is where ventilation has been heading for 5,000 years, ever since the first pharaoh was cooled by a slave with a palm frond.

Or . . . maybe not.

Bottoms up

Fact: UFAD turns the floor into a plenum. The floor is exposed. In construction's state-of-the-art, floors are not built to have their contents interact with human lungs.

Recently, a building science expert discussed exactly what people will be breathing into their lungs if their air supply traverses the floor. Perhaps the list was not all bad. Some, however, might trip over a list that included "mice dander" and "bird leavings."

Keep your focus on a *single fact*: Not enough research has been done into UFAD installations. There's just not enough information. We at the Testing, Adjusting, and Balancing Bureau (TABB—www.tabbcertified.org) have

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UFAD continued from page 16 followed up on what's out there.

What we found, for the most part, were positive case studies. We sought to discover if the promoted installations were, some time after they were featured, still wonderful.

In each of our follow-ups, the case study was telling the truth . . . as far as it went. Originally, the system performed well. But time passes. In our follow-up we heard a different story. In 90% of them, there are serious indoor air quality (IAQ) problems and complaints.

No, that's not a misprint—90%. And that's from the positive side of the ledger!

A no-drainer

Then there's *the no-drain swimming pool problem*.

What?

This real-life horror story is told by a contractor. Awarded the HVAC contract on a UFAD job, he noticed the building was sprinklered. He put two and two together and came up with a negative number! Here's his devastating logic:

1. If the sprinklers were activated, water had no place to go except the floor.
2. The floors did not have drains. The water would remain in place.
3. Should the sprinklers be needed for a significant period, the UFAD system would become a swimming pool.
4. Without a drain, the water would stay in place . . . probably until someone pumped it out!
5. He asked the building's engineers and designers: *Did the structural engineer include the weight of all that water*

in his calculation? Answer (given sheepishly): No.

Working in HVAC since 1966, I've heard a number of colorful phrases useful in such situations. Most are unprintable. Let's use this one: BAD. A fire could lead to a pancaked building.

Let's go further, with a "thought experiment." What if we fix BAD UFAD by adding drains to every swimming pool...I mean, on every floor? Some facts:

A. Reminder: The UFAD system supplies air to human lungs.

B. Drains back up; air flows out from the drain. When this happens, drains backfeed sewage gas and other airborne pollutants.

Real-world summary: Our contractor's building was a potential disaster (in the term's literal meaning).

Thought experiment summary: Adding drains to such a building design might solve the pancaking-building problem. In the process, though, we might create the ultimate pollutant distribution system!

But it worked in the lab!

As noted, there's not been enough research (and thinking) invested in UFAD. Consider the energy-savings angle. Efficiency claims of UFAD proponents are, in large part, based on laboratory conditions.

Everything is *ideal*. There's no allowance for how things work in reality. Less energy is used; building occupants won't have IAQ complaints; they'll be comfortable in any climate. And, of course, they'll sell at NASDAQ 5,000 and buy at NASDAQ 1,100!

Back in the real world, we've talked with building owners. They tell us their UFAD systems are not producing the promised outcome. Beyond the missing energy savings, there are the IAQ complaints. It's a double hit.

Additionally, there are—or should be—life safety concerns. In a fire, UFAD systems will serve as excellent distributors of the products of combustion. Yes, that includes smoke.

Some of us remember the MGM Grand fire of 1980. People died on that building's upper floors. The fire itself never got to their floors; there was little or no smoke found in lungs of the deceased. They had died as the result of inhaling air heavy with toxic gases. There was, in the aftermath, a major hullabaloo about plastics in building construction (and even in hotel furniture).

UFAD systems are designed so as to quickly maximize distribution of these toxic gases. That, of course, is not their purpose...but it is a result that needs consideration.

Insist on the facts

Between December 1999 and October 2000, the NASDAQ index stayed above the 3,000 level. More than 190 billion shares were traded in that period. The index briefly bounced above 3,000 in December 2000, but hasn't seen it since.

Those who bought and held in that period are still at least 33% short of break-even. Plus, of course, more than three years have gone by in the interim.

Our industry should not make a similar mistake by throwing bucketloads of credibility at UFAD. As now in use and envisioned, the concept has problems. Perhaps they are not insurmountable; but I've not yet seen an HVAC problem yet that gets better when you ignore it. ■

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