

What Every Tech Should Know About IAQ



RSES Journal sits down with one of Johnson Controls' IAQ experts to discuss the issues facing HVACR technicians today regarding one of the industry's most important subjects.

BY JOHN IWANSKI

[Note: This interview covers a wide range of topics in and around the theme of indoor air quality. In the creation of this feature, some answers have been edited for clarity or brevity. For more information on the issues covered in this feature, as well as other IAQ and controls questions, readers can e-mail mimoun.abaraw@jci.com or call 316-239-2907.]

Worries about H1N1 “swine flu;” conditions that can promote mold development; VOCs; dust and pollen; and widely varying temperatures that make homeowners uncomfortable are just a few of the things that concern home- and business owners when discussing IAQ and indoor comfort. Those issues also place HVACR technicians square in the crosshairs of the battle to eliminate



⌘ While pandemics—such as the current swine flu outbreak—can be a cause of concern for homeowners, technicians should take care to focus on what equipment can do and how it can help supplement other steps end-users may be taking based on recommendations from health officials, doctors and others.

“sick” buildings and help improve the efficiency of today’s advanced systems.

Recently, *RSES Journal* spoke with Mimoun Abaraw, Product Manager for Indoor Air Quality Products and Controls with Johnson Controls Inc.’s Unitary Products division. In addition to being one of JCI’s experts on IAQ and humidity control, he also has a thorough understanding of mechanical systems and how they can help solve the myriad of ever-changing IAQ issues. The following questions and answers address many of the things today’s contractors/technicians face in the field as they relate to IAQ.

RSES Journal: IAQ is a far-reaching subject, but in the realm of HVACR—and the HVACR technician—what are some of the biggest factors that can affect the IAQ of a customer’s home? What “symptoms” would a contractor say indicate a problem?

Mimoun Abaraw: Basically, IAQ problems come down to the following: improper humidity, airborne particulate, and uncomfortable or inconsistent temperatures in the home. The biggest factors or symptoms of these problems are health issues, lack of comfort, the need for energy savings and the desire to protect the home—and everything in it—from damage that may come from contaminants. When it comes to breaking down those four areas, here are some important things to consider:

Health—According to the EPA, air in the home can sometimes be 100 times worse than outdoor air. If the customer suffers from allergies or asthma, improved comfort is almost certain if you [the technician] can eliminate those particles, since they are really what irritate those with health-related problems. Breathing in virus particles, dust, bacteria and allergens can trigger asthma attacks and create many other respiratory problems.

Comfort—It is a fact that humidity level in a home without a humidifier can actually be much drier than the desert—and that is really uncomfortable! Homeowners really don't know that when you heat the air, its ability to hold moisture increases and the relative humidity decreases. What they do know is that they hate static shocks, feeling cold or being uncomfortable. Comfort is one of the biggest reasons homeowners purchase whole-home humidifiers.

Have you ever stepped out of a shower and noticed how warm and muggy the bathroom is? It is probably 75°F and 60%–70% relative humidity because of all the water vapor in the air. And when you step outside the bathroom, you feel chilly, yet the temperature is almost the same. That's because of the evaporative cooling effect that's occurring. You are wet, and the thirsty, dry air outside the bathroom absorbs the moisture on your skin, creating the cooling effect. This goes on daily in millions of homes during the winter months, with people turning up their thermostats to stay comfortable and warm. Dry air also can promote those aforementioned electrical static shocks.

Energy savings—Maintaining correct humidity levels can help the homeowner save energy and money by allowing them to turn down their thermostat. If you install a whole-home humidifier, the customer saves money. Plus, properly humidified air at a lower thermostat setting is much more comfortable than very dry, warmer air.

Protection—Every HVACR technician knows what can happen when coils get loaded with dust, pet hair, car-

pet fibers and other types of contaminants. Protecting the HVACR system is just one more benefit that consumers realize when they install a higher-efficiency filtration system on their equipment. It keeps their system operating just like the first day it was installed.

With this in mind, it's important for you [technicians] to make observations in the home and ask questions. These observations and the answers you receive allow you to be more than just the guy who works on the HVACR equipment; it lets you become the total comfort expert. For example, if you see cracked woodwork around doors and windows; separated wood floors; a grand piano in the living room; or a damp basement with signs of mold, there is a need for a whole-home dehumidifier. If you see portable room air cleaners, suggest a whole-home air cleaner.

RJ: Moisture levels, in some environments, are one of the biggest contributors to IAQ problems. How important is it for a technician to properly diagnose the amount of moisture circulating through the system; and what are the proper steps to take to adjust those readings?

MA: A sling psychrometer is the best instrument for measuring in-home humidity levels, and measurements should be taken in various areas of the home. Unfortunately, the actual amount of humidity a home can tolerate changes as outdoor temperatures fluctuate. It is far more important for you to look for signs of improper humidity than to measure the level. That's because the signs of improper

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humidity represent what happens over a long period of time; measuring the humidity level is only a snapshot in time.

RJ: In that same vein, if the technician finds high moisture levels, what options or steps can they take to dehumidify the space effectively? For extremely dry spaces, what can they do to help humidify the space and ensure occupant comfort?

MA: The real key is to maintain optimum levels of humidity year-round. Ventilating the space can assist in reducing high humidity levels during dry winter days. A whole-home dehumidifier incorporates built-in ventilation and can dehumidify the entire home. During the winter, whole-home humidifiers can deliver optimum amounts of humidity as outdoor temperatures fluctuate. And, by incorporating an optional automatic humidifier control, the process of controlling humidity is completely automatic, making it simple for the homeowner.

RJ: Mold is another issue technicians may encounter on a call. What are some telltale contributors to mold problems? What can technicians do to mitigate the problem?

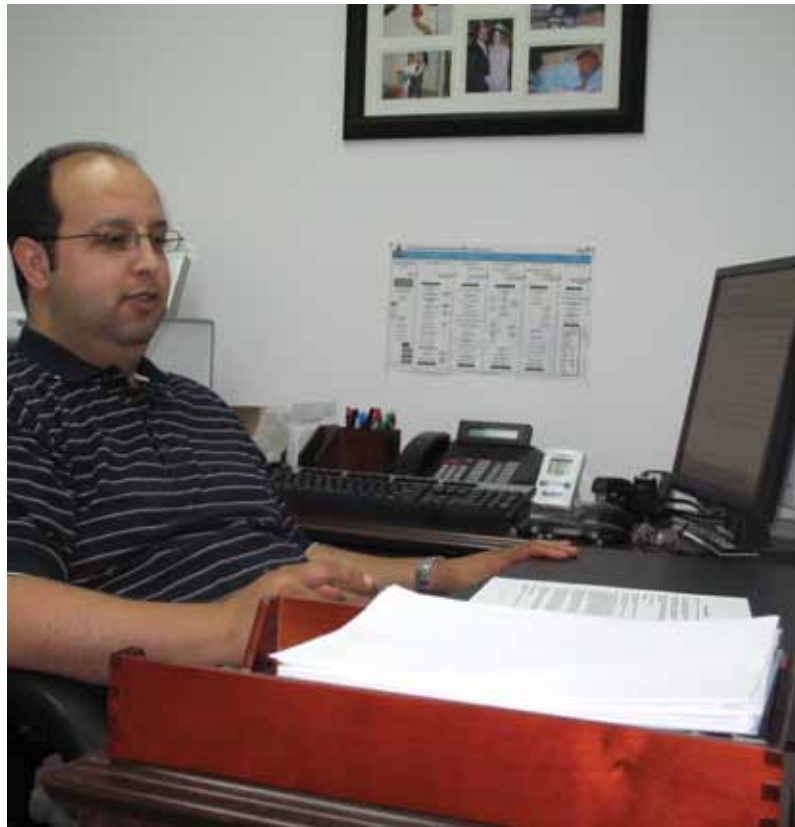
MA: Mold typically occurs in cool, damp places as well as where insulation is inadequate, allowing for air leakage. So, one way to attack the problem is to add insulation to reduce the air infiltration in these areas. In other cases, it can be caused by too much humidity. In these applications, the whole-home dehumidifier can be used to maintain proper humidity levels.

RJ: Filtration plays a key role in IAQ. Talk about the importance of filtration as it relates to IAQ; some of the developments technicians can use to help reduce dust, pollutants, VOCs and other airborne particles; and recommendations they can make to home-/building owners to help reduce the movement of airborne particles through the HVACR system?

MA: A whole-home air cleaner is an absolute necessity. It keeps the components of a high-efficiency HVACR system operating at peak performance, and also removes particulate from the airstream that occupants would otherwise be breathing. The key to maintaining the cleanest space is circulating as much air through the air cleaner as possible; maximum particulate removal is achieved by running the blower continuously. If this is unacceptable to the homeowner, encourage them to turn the blower on a half-hour before vacuuming and [let it] run for several hours after. Running the blower allows the system to remove many of the particles sent airborne from vacuuming.

RJ: Obviously, one of the biggest recent stories in the news is the H1N1 swine flu outbreak. As it relates to HVACR, what—if any—recommendations can techs make to help prevent the movement of airborne diseases, etc. How can technologies such as UV lighting help reduce these types of threats?

MA: Similar to other health scares seen in the past—such as the anthrax scare—take caution when offering advice. As a technician, you do not want to make health claims or pretend to be a doctor; deal with the reality of what the equip-



✦ **Mimoun Abaraw, who serves as one of Johnson Controls' experts on humidity and indoor air quality, takes a break to share his ideas and opinions on a subject that impacts nearly every HVACR contractor and technician.**

ment can do. For example, hybrid electronic air cleaners remove tiny virus-sized particles measuring 0.01 microns at an 80% rate—but do not remove specific virus types. Similarly, UV lamps do not “zap” particles out of the air. Rather, when installed above an evaporator coil, a UV lamp will absolutely kill anything growing on the coil with constant exposure to the light. The key [is] explaining to the homeowner how to get the maximum use from the IAQ products installed in the home to maintain the healthiest environment.

RJ: What are some key things technicians should keep in mind about IAQ?

MA: Every home has IAQ issues; it is your opportunity to help the homeowner identify them. First, you are not just a furnace or A/C technician, you also are an IAQ expert [who is] there to make the person's home more comfortable. Second, a homeowner will buy an IAQ product when the perceived benefits exceed the cost to purchase the product. Your opportunity is to identify the problem and deliver the benefits. Third, always remember that the homeowner is not buying a specific product for its size, shape or color, but for the benefits and higher level of in-home comfort it delivers. Explain to them how that product does that! Finally, the homeowner doesn't have the opportunity to say “yes” if you don't ask for the order. They can always tell you to come back in the future, but it's even better when they believe what you say and [so] want you to install it.☺