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Nate “the House Whisperer” Adams HVAC 2.0, IAQ and the Art of the Possible

This week we welcomed back Nate Adams for a lesson on HVAC and IAQ. We did not get to discuss HVAC as much as we wanted with Dr. Joe Lstiburek so we asked Nate to join us and continue the discussion. We discussed his electrify everything mantra, the HVAC 2.0 program and BAD ASS HVAC. Nate and his partners are trying to shake things up but also keep in mind “the art of the possible”.

Nate “The House Whisperer” Adams is the author of The Home Comfort Book and has helped numerous clients make their homes healthier, more comfortable, and able to run on clean electricity. He and his partners have adapted that upgrade process into the HVAC 2.0 program which gives HVAC contractors a business model to deliver the same results for their clients while enjoying their work more and being more profitable.



His focus on residential electrification retrofits earned him the moniker “The Father of Electrify Everything” from Panama Bartholomy, CEO of the Building Decarbonization Coalition. He splits his time between living on the Cuyahoga River in Hiram Ohio and in a former West Virginia coal mining village with his wife and young daughter.

Nuggets mined from today's episode:

Nate agrees with Joe Lstiburek's wisdom: assuming water will get in and doing advance planning to let the water get out and that building science concepts and construction methods of 30 years ago were due for an update.

The coming mold explosion is here. Today's requirements are to remediate the mold and to prevent it from coming back.

Nate's recommendations are designed for implementation in reasonably good buildings that don't have bulk moisture problems. Nate's work is to use the HVAC system to deal with the moisture in the home.

We are beyond multiple tipping points: Dew points are higher, downpours are greater, more energy efficient HVAC systems provide less dehumidification. Less moisture tolerant engineered building materials are more common and increased shading.

Building Science Legend, John Tooley developed building science processes to make buildings awesome. John Tooley lives in North Carolina and this summer found that dewpoints in the 70°F-80°F were common.

In 2009, Cleveland nighttime temperatures were rising. Nighttime temperatures have a big effect of dew points. Higher night time temperature often cause more uncomfortable days.

During shoulder seasons Lew Harriman recommends that dew points not exceed 55°F. When dew points rise is when houses get sick. When dew points rise basements smell bad. www.dpcalc.com website

Old school 8 SEER air central conditioners split moisture removal between sensible and latent, 50% sensible / 50% latent.

Today's 15 SEER Air Conditioners split heat vs humidity removal at 90% sensible and only 10% latent. A better solution is a *new school* Inverter 18 SEER Heat Pump 50%-90% sensible and 10%-50% latent. Bosch, Daikin Fit, and Lennox make these smart community systems which share outdoor and indoor information with the

thermostat. These systems while more costly initially, provide added benefits of greater operational efficiency and occupancy comfort.

Due to multiple tipping points, the solutions are variable speed AC & Heat Pump with a whole house dehumidifier OR reheat dehumidifier. Whole house dehumidifiers can be tied into the existing HVAC system. These dehumidifiers have a 5-10 year lifespan and will need to be replaced twice over the lifespan of the heat pump. Whole house dehumidifiers typically range in price \$3K-\$6K installed. Reheat dehumidifiers (hot gas or electric) have been used in commercial systems for years. These systems end *thermostat wars* by creating temperature and humidity conditions both men and women find comfortable.

One System Manages It All- Bad Ass HVAC (Bad Ass stands for: Big Drop Air Source System). The Bad Ass HVAC accomplishes all 6 Functions of an HVAC Systems: match the load, filter, dehumidify, fresh air, mixing and humidification. Variable speed heat pump, giant ductwork mixes air, reheat dehumidifier (AC+ resistance low stage adds heat after the coil), Watersaver® humidifier, slowing air movement improves filtration (filter mounted horizontally), outside air. Controller need to reduce humidifier output according to outside temperature. 3 variations of the Bad Ass HVAC system: standard, attic and hybrid.

Nate and his partners constructed and installed a working Bad Ass System in the MeasureQuick office space. The system has all the bells and whistles, alternate products for comparison. The system and office space serves as a field laboratory.

Nate loves data. The 40 Foobot® air monitors Nate has installed in client homes provides him with useful data. Haven® air monitors, are like OBD2 scanners auto mechanics use to monitor and diagnose vehicle problems.

Fresh air from the outside isn't always fresh!

85% of the HVAC systems in homes are builder grade, the lowest cost systems available.

When dealing with potential clients Nate determines 3 key factors, what are the problems, what are the goals and what is budget?

Nate currently has 30 contractors utilizing the HVAC 2.0 method. Contractors using his method can walk into any house with their head held high, confident that they have a solution. To Nate and his contractor followers, their process is sacred. The process, similar to triage at a hospital; sorts out problems that can only be resolved in an emergency room or intensive care unit from those that can be resolved by a simple visit to clinic. Nate and his contractors seek to find and deliver value.

Nate suggests that Chapter 2 of his book HVAC 101 be given to potential clients.
<http://tinyurl.com/hvac101>

Final Comments:

Radio Joe- when it comes to humidifiers, maintain it, maintain it, maintain it!

Nate Adams- hopes that known building science will be applied as knowledge unapplied is useless!

Z-Man signing off

Trivia Question:

Name this device consisting of 3 components used to measure the air tightness of buildings, airflow between building zones, duct air tightness and to physically locate air leakage sites in the building envelope?

Answer: blower door

Answered by: Reddie Ward