

The rise of the healthy home:

How builders can differentiate and deliver on homeowner demand



Homebuyers know more about residential indoor air quality and energy efficiency than ever before. Building a home with the healthy features they want is no longer a nicety – it has become a necessity. Here's a guide to navigating this changing landscape.

Introduction

Nearly every industry has experienced the impact of the COVID-19 pandemic in some respect, and new residential construction is no exception. With U.S. Census figures indicating the number of Americans working from home tripled between 2019 and 2021¹ – and fully remote and hybrid work options likely here to stay – it's safe to say that awareness of our spaces' strengths and shortcomings has never been greater.

Space requirements are changing, of course. But so are expectations of healthy-home features, including

improved indoor air quality (IAQ). "Consumers are better educated today on the value of air quality than they were 2½ years ago, because of the pandemic," says Tyler Smith, vice president of Healthy Buildings at Johnson Controls. "There was a certain persona, a techy persona, out there for years who was investing in fresh-air systems and higher filtration. It was a small percentage of buyers. But that's no longer the case."

In fact, more than 60% of homeowners now say IAQ is their top priority for a healthy home.² But while

IAQ requirements have historically been strong for commercial buildings, the same standards rarely applied to residential settings. The result? In many cases, IAQ at home is worse than at the office.

Combine this with newer construction codes aimed at creating a building envelope that's tighter than ever before – more energy-efficient but no longer providing necessary ventilation through leakage, as it did in the past – and you have a particularly keen need for IAQ solutions in the homes you build.

Considering those solutions now is key. Climate change and extreme weather events, as well as a power grid that is evolving away from fossil fuels and toward electrification (see “How building electrification contributes to decarbonization” below), will only speed up the requirement for new construction to further prioritize energy efficiency and IAQ. Some cities, including New York, Denver and Seattle, have even enacted or proposed bans of natural gas connections to new homes.³ Change is in the air, quite literally, providing builders with the opportunity to differentiate from the competition and deliver the healthy-home solutions buyers need.

Investments in features that generate long-term value

When building a new home, it is important to invest in features that are affordable to incorporate now

but expensive to add after construction is complete. Examples include:

HVAC filter racks that accommodate large (up to 4-inch) filters. Large filters help remove particle-based pollutants such as dirt and dust from the air – something especially important for people who suffer from allergies. “This gives you the ability to have higher filter efficiency and better clean the air,” says Jon Douglas, director of Healthy Buildings Services and Solutions at Johnson Controls. “The filters also last longer. I have them in my house and I only replace them every six months.” Filter racks accommodating large filters are easy to incorporate into new construction, Douglas notes, but difficult to retrofit to an existing system.

Sealed ducts throughout a home's conditioned space, which many building codes already require. These help ensure efficient airflow and reduce the chance for dirt, dust and other particle-based pollutants to spread through the air. As with filter racks, they're easier to incorporate during construction.

Range hoods that vent outside. Pollutants produced from cooking represent one of the biggest sources of indoor air pollution, which range hoods help mitigate. In addition, gas appliances, including fireplaces and space heaters, should also be vented outdoors.



Did you know
that buildings make up **31%** of energy-related CO₂ emissions in the U.S. and nearly **50%** of all homes use natural gas for heat?⁴

How building electrification contributes to decarbonization

To reduce reliance on fossil fuels – which create the emissions that lead to respiratory disease and contribute to climate change by trapping gas – municipalities around the country are developing electrification policies, including phasing out connections to natural gas. At the same time, the technology behind everything from heat pumps to electric vehicles is improving. As a result, the U.S. Energy Information Administration estimates the carbon intensity of U.S. electricity generation will drop more than 26% from 2020 to 2050.⁵

Building electrification, in particular, describes the move away from fossil fuels toward electricity for heating and cooking. And as electricity is increasingly powered by solar, wind and other zero-carbon sources, the grid – and the homes you are building today and in the future – will gradually become greener, too.



The heart of the home: A high-efficiency HVAC system

From a systems standpoint, IAQ solutions start with ventilation by way of a central HVAC system – including a high-efficiency heat pump or air conditioner, which is typically paired with an air handler or furnace – as it is responsible for distributing air to rooms throughout the home. Running the fan in the HVAC system helps to improve comfort and IAQ by mixing the air. Consider these examples:

For comfort. Some rooms may be colder than others. Running the fan mixes the air from the warmer rooms with that of colder rooms, thus warming up the colder rooms even when heat is not running.

For IAQ. Gas-based pollutants such as CO₂ can build up without adequate airflow, especially in smaller common areas where people congregate, and in bedrooms at night. Running the fan will mix the polluted air in these spaces with clean air from the rest of the house, improving the air quality in those spaces.

The best way to provide mixing is by installing a **variable-capacity heating and cooling system.** With a variable capacity system, the heating or cooling is continuously adjusted to meet the setpoint temperature. The result is that the central fan runs the majority of the time rather than cycling on and off at

full speed, as is the case with a single-stage entry-level system, thus ensuring a better mix of fresh air.

As part of the HVAC system, heat pumps have become an energy-efficient – and increasingly viable – means to heat a home using electricity. Because heat pumps draw energy from the electric grid, as the grid gets greener, a home’s heating system will generate fewer CO₂ emissions. (In contrast, a gas furnace, which directly generates CO₂ as it heats a house, will continue to generate the same amount of CO₂ regardless of improvements to the grid.) “Even in areas where gas is still available, you can still make the case that a heat pump is a cost-effective, sustainable solution for the builder and homeowner,” Douglas says.

After this essential equipment, Douglas recommends adding accessories to create an ecosystem that fully optimizes IAQ, including:

Whole-house humidifiers and dehumidifiers.

Dehumidifiers (particularly in southern regions and during summer) and humidifiers (particularly in northern regions and during winter) ensure an optimal humidity level, which helps reduce the conditions for mold, bacteria and viruses to grow. “Humans are more susceptible to viruses and bacteria when the air is dry,

so maintaining higher humidity in the winter is good," Douglas says. "And if the humidity gets too high in the summertime, mold can grow." Humidity levels in the 30–50% range are considered ideal.

Energy-recovery ventilators. These accessories, often called heat exchangers, are used in the summer to pre-cool the hot outdoor air, and in the winter to warm the cold air coming from outside and cool off the warm air that's venting from inside. "Because the outside air comes into your house warm, you're able to save energy while ventilating," Douglas says.

Touch-screen thermostats. Some models now have wireless-control capabilities so homeowners can remotely monitor HVAC settings for optimal IAQ.

Together, these products help create the ideal ecosystem for a home that is healthy and energy-efficient.

Solutions for your next project

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62.2 for residential buildings provides best practices for IAQ.⁶ Need a partner to help you navigate the options? Johnson Controls solutions are designed to help you deliver the healthy homes buyers want. Plus, we make the purchasing process work for you with customizable pricing, product solutions that perfectly fit what you need for your next project and contractor coverage for 93% of all U.S. housing starts.⁷



A trusted, time-tested partner

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Johnson Controls innovations in the commercial sector have informed the expertise we bring to the residential sector. Our total home solutions include products that help you build homes to exacting IAQ and energy-efficiency standards.

Want help streamlining your options?

Visit johnsoncontrols.com/newconstruction to learn how we can partner with you.

Sources

¹<https://www.census.gov/newsroom/press-releases/2022/people-working-from-home.html>

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⁴<https://www.usgbc.org/articles/building-electrification-why-it-matters>

⁵<https://www.eia.gov/energyexplained/energy-and-the-environment/outlook-for-future-emissions.php>

⁶<https://www.ashrae.org/technical-resources/bookstore/standards-62-1-62-2>

⁷Zonda, 2022 U.S. Census Single Family Permit counts with Johnson Controls dealers