Indoor Air Quality Becomes a Bigger Issue

**The COVID-19 pandemic has strengthened the focus on boosting the wellness factor at home.**

Before the onslaught of COVID-19, the building industry was already developing procedures and products for improving indoor air quality. Building envelopes have become much tighter as triple-pane windows, insulated garage doors, and energy recovery ventilators became more common in new homes and remodeling projects.

As concerns about interior air quality become more intense, builders and developers may be called upon to provide answers about how healthy their new homes and apartments actually are. Filter companies and HVAC manufacturers have already started to produce products that will help them make their mark on the healthy homes of the future.

According to the U.S. Environmental Protection Agency, Americans spend 90% of their time indoors, and indoor air is typically two to five times more polluted than outdoor air. To establish a baseline of how compromised interior air might be, homeowners or would-be homeowners can compute a [Hayward Score](https://www.haywardscore.com/) online, which is designed to help measure a home’s health factor via questions about a home’s insulation, fresh air supply, and moisture issues. The [Well Building Standard](https://www.wellcertified.com/), which has been around since 2014, also serves as an educational touchstone for builders and developers who want to learn more about the health of a house and the air inside.

In terms of the usual suspects making bad air in older homes or new construction, it’s a familiar list to most builders. “The most common problems are range hoods that recirculate the air versus exhausting to the outdoors, inoperable or insufficient bathroom exhaust fans, and mold and moisture problems,” says Russell Pope, industry development manager for Panasonic Life Solutions. Controlling VOC levels and outgassing has already changed the world of finishes, furniture, paints, and sealers. HVAC systems, filters, and purifiers are also being improved.

Along with other manufacturers, Panasonic is using emerging technology to take indoor air quality to new levels. “I would have to say that indoor air quality sensors are at the top of the list, but they need help,” says Pope. “The sensors are great to identify IAQ concerns, but they are just cool gizmos until they are connected to other devices that take action.”

Panasonic’s latest effort to boost indoor air quality sounds like a device transported from a science fiction future that taps nanotechnology. The firm’s “nanoe X airborne purification system” is designed to purify the air as opposed to just recirculating it.

“The patented technology taps existing moisture in the air and applies high voltage to produce nano-sized charged water particles,” says Victor Flynn, senior product manager for Panasonic. “The nano-sized water particles, which envelope large amounts of hydroxyl radicals are released into the air and onto fabrics to decrease common odors and inhibit pollutants in the indoor environment.” The system is typically paired with a Panasonic ClimaPure indoor HVAC unit.

Flynn has seen interest in the system grow along with the spread of the virus. “Since the pandemic, we’ve seen a greater interest in solutions that help provide better IAQ for indoor environments,” he says. “In general, people are gaining greater awareness of the importance of good indoor air quality for a fresher, cleaner and more comfortable indoor environment.”

Recirculating air through a house coincides with higher health ratings, assuming the outdoor air is relatively clean. Broan [NuTone](https://www.builderonline.com/manufacturer/nutone) offers an array of energy recovery ventilators, heat recovery ventilators, whole-house air exchangers, range hoods, and exhaust fans. Broan recommends matching any type of interior fan with filters that hold the highest rated MERV standard, which measures how effectively the filters trap unwanted particles. Broan’s purification systems can be used in concert with an existing HVAC system or work as a standalone.

“As a standalone, we recommend ducting the system into rooms where occupants are spending the most time like the bedroom, living room, and kitchen,” says Patrick Beloin, product marketing manager for [Broan](https://www.builderonline.com/manufacturer/broan). “We recommend pulling air from the rooms with the worst air quality including the bathroom, basement, and kitchen. When linked to a furnace or another HVAC system, we connect the system to the return duct and use the air handler to move air throughout the home.” Retail prices for Broan’s systems range from $500-$1500.

According to Beloin, homeowners typically find the company's products after doing a bit of research. “Many people begin the process of improving their indoor air quality by asking about purifiers and filtration, but they find that fresh air systems and ventilation are the more comprehensive solutions to their worries because they remove dirty air and replace it with fresh air, rather than attempt to filter and recycle the air in the home,” he says.

Filters have become technologically advanced, just like everything else. A new system from Filtrete matches a sensor onto a furnace filter, and homeowners or building owners can check the condition of the filter via a smart phone app. Filtrete is a division of 3M, which is also seeing an uptick in interest in anything having to do with interior air quality. From a filtering point of view, it’s all about capturing the smallest of particles in the filter.

“Smaller particles in the air may remain suspended for hours or days, and they are also much more difficult to filter," according to 3M. The manufacturer's Microparticle Performance Rating compares the filtration performance for the smallest particles, 0.3-1.0 microns in size, that are measured in the industry standard.

When it comes to virus prevention, HVAC systems, filters, and nanotechnology can't provide the final airtight answer, but air purifying and filtering systems can help with virus mitigation. Hospitals fighting the virus rely on negative pressure rooms or enclosures where fans pull air into the space, filters it, and then sends it back outside.

3M recently completed third-party testing of multiple models of Filtrete filters’ ability to capture viruses from the air passing through the filter. In these tests, according to the company, the 1500 MPR filter demonstrated a 71% average efficiency for filtering airborne virus, and the viral filtration efficiency increased as MPR increased, up to a maximum 96% average viral efficiency for the 2800 MPR filter.

The question of surface virus contamination raises another weakness of purifying and filtering interior air. “It will not filter out the virus already on surfaces in your home,” explains Broan's Beloin. “It will filter out a multitude of pollutants coming into your home via a high-level MERV filter, but it’s highly unlikely that a contagious virus will infiltrate your home on a strictly airborne level and not on a surface level like unwashed hands touching the light switch.”

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