Breathe Right

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Good indoor air quality can be the key to keeping employees safe, comfortable, and productive.

Proper building operations and routine maintenance are critical to ensuring healthy indoor air quality (IAQ), says OSHA. While this may be the case, many manufacturers require a strong business case when it comes to investing in the best available technology to truly apply IAQ best practices.

Quality Control

According to OSHA, NIOSH (The National Institute for Occupational Safety & Health) determined that inadequate ventilation, contamination from inside the building, and contamination from outside the building were the top three sources of IAQ problems. “These types of issues can be solved by doing things like maintaining the building heating, ventilation, and air conditioning (HVAC) system,” says OSHA. In addition, “following guidelines for ensuring adequate ventilation as office suites are rearranged, routinely cleaning office spaces and common areas, and properly storing cleaning and other chemicals that are used in the workplace” also ensure proper IAQ and are all part of a well-developed building operation and maintenance plan.

While these first steps sound basic, they are not be to undervalued, especially considering the kind of risks a manufacturer might run by dismissing the importance of IAQ.

Dollars and Sense

Moffitt Corporation has been in business for more than 50 years, providing industrial ventilation and heating equipment. With years of expertise in the field, company president John Moffitt is no stranger to IAQ concerns. “Air quality directly impacts worker performance, and equipment efficiency, resulting in decreased performance and increased operational costs,” explains Moffitt. “Providing a properly ventilated facility not only improves productivity, it improves worker morale as well.”

The productivity drain suggests an easy sell when it comes to encouraging company management to make the decision to purchase more technically advanced ventilation equipment. While this is partially true, manufacturers like Moffitt still find themselves developing creative methods to help end users get the biggest bang for their buck. The “Zone of Occupancy,” says Moffitt, is one way manufacturers can best target the use of their investments.

For anyone who has utilized zone lighting initiatives as a low hanging fruit in energy efficiency initiatives, a ZOO assessment is a similarly selective use of resources where they’re most needed. “The zone of occupancy refers to the operating area of a facility where the actual ventilation or air replacement is required,” he explains. “By focusing ventilation to the specific area required, improved comfort can be achieved at a lower equipment and operational cost, as compared to introducing air into non-critical areas.” The ZOO might include specific workstations where warm air is removed and cooler, fresher air is supplied in order to provide comfort for employees. On the upside, these targeted approaches keep the fresh air where it’s needed most, eliminating costly full-facility usage. “Most facilities suffer from a lack of proper intake air. Introduction of fresh air directly where it is required (ZOO) provides the greatest ventilation improvement for workers and is the biggest bang for the buck,” says Moffitt.

Technology Improvements

Moffitt Corp has utilized its expertise in the industry to help improve upon existing technology, specifically with a method called “Computational Flow Dynamics.” In this case, CFD can help supplement existing formulas for determining overall building flow requirements (notably the ASHRAE formula for natural ventilation). “The ASHRAE formula is very useful,” says Moffitt. “However, it is not able to predict specific temperature at different elevations or areas of the building. CFD modeling helps predict airflow velocities and temperatures at any point within the building, and helps refine unit selection and location, resulting in lower system cost and improved performance.”

Dust Bust

While poor IAQ can be a productivity killer, other air quality issues can literally kill your associates if you’re not careful. One of the most dangerous situations for a plant comes when certain combustible materials form an explosive dust. According to OSHA, “Materials that may form combustible dust include metals (such as aluminum and magnesium), wood, coal, plastics, bio-solids, sugar, paper, soap, dried blood, and certain textiles. In many accidents, employers and employees were unaware that a hazard even existed.”

While there are certainly plenty of solutions to potential combustible dust risk—dust collection systems, for one—it seems that some manufacturers are still a little hazy on what constitutes this risk. According to combustible dust collection equipment manufacturer, Camfill Farr APC, potential hazards can include anything from food ingredients (sugar, flour, grain) to pharmaceuticals.

National Fire Protection Act (NFPA) 654, the standard for the prevention of fire and dust explosions from combustible particulate solids, is facing a number of hurdles. Originally slated for release in 2010, the revised standard was rejected by the NFPA membership and rescheduled for release in 2012.

Confined Space & Safety

Another area manufacturers need to pay close attention to, according to Dennis Von Ruden, is the safety of the workers in confined spaces in their plants. In fact, the president of General Equipment Company, manufacturer of confined space and positive pressure type ventilation products, says this once-buzzed-about topic has become de-prioritized over the years.

“In a sense,” Von Ruden explains, “it’s easy to see why the topic of confined space ventilation has become less concerning. In the vast majority of confined space entries when an incorrect ventilation procedure is used, nobody gets hurt. In fact, end users don’t usually recognize their errors as long as everyone leaves the confined space area without incident.” Unfortunately, these don’t always serve as the warning signs they should. According to Von Ruden, there are still some errors that get caught too late. “Approximately 100 people die in the United States each year from confined space ventilation issues. With this in mind, it’s time to start putting more thought into buying the right portable ventilation equipment for your specific applications, rather than leaving worker safety up in the air.”

One good solution is finding a portable ventilation blower—but not just any blower will do and the best solution will depend on the type and size of each space. The type of space is important, says Von Ruden, for a few specific reasons:

- Does it require a permit before anyone can enter? Permitting is not a federally-governed process, but rather a system of helping safety professionals keep their protocols in check. Many blower manufacturers can help by providing permit templates.
- Is the confined space considered a hazardous location? If so, only certain ventilation blowers can be used. These hazardous-location blowers feature special housings, which will not spark when contacted. They also include explosion-proof motors, and special ventilation ducts which reduce the chance of a discharge from creating an explosion.

Once the type of area is selected, the hard part begins. “There is not a one-size-fits-all solution when it comes to ventilation blowers,” says Von Ruden. “Instead, one must do the math to ensure workers are getting the proper air flow.” (For examples on how to calculate volume, see sidebar on page 25).

And once these initial steps are taken, users can find a breadth of power options and service life expectations. For Von Ruden, the key here is to get this issue back to the forefront of facility operations and safety. “It’s time to bring confined space ventilation back to top-of-mind awareness and make sure that all personnel enter — and exit — confined spaces safely, each and every time.”

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