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## UVC Keeps Out Unwanted Condo Resident: Mold UVC Installation in Toronto Condominium Could Be Largest of Its Type

It is widely suspected in the general public that people can develop allergies, asthma, and other conditions because of their air conditioning systems — but they miss the important information. They don't realize that mold growth in the cooling coil, in the heart of the a/c system, is a major culprit.

Furthermore, mold buildup within a/c systems, including the fan coil units found in condominiums and apartments, is a universal occurrence. It is not limited to hot and humid climates.

Every once in a while, building operators will act proactively. This was the case with the condominium board of Number One York Quay, Toronto. The group found an effective and affordable solution to make sure mold did not become a problem for its 2,000 residents.

When the board decided to retrofit its buildings' 20-year-old a/c systems, the members decided to include germicidal UVC products to stop the growth and spread of mold and mold spores, viruses, and bacteria.

According to board president Ken Wigley, "The UVC Emitters have improved indoor air quality and system cleanliness at a fraction of the cost of alternative strategies." The installation, which included 1,240 fan coils, plus the makeup air units that serve the building, is believed to be the largest of its type.

### SEARCH FOR SOLUTIONS

The job went beyond replacing the a/c systems. It really focused on mold remediation. The fan coil units in Number One York Quay's two 40-story towers were showing their age. Determined to refurbish the units and eliminate existing mold, the board did extensive research in concert with onsite property manager Brookfield Residential Services Ltd., Toronto.

Naturally, they looked into removing moldy insulation lining the inside of the fan coils and replacing it with new insulation and coils, but the cost would have been prohibitive (about \$2.5 million), and the solution would have been temporary. The mold would certainly return in time. They also investigated a number of sprays and coatings, and finally, they discovered UVC-based products.

The board learned that devices using the C wavelength of the UV spectrum (UVC) are able to target the DNA of mold, bacteria, and viruses, killing the cells or making replication impossible. UVC products are installed in a/c systems opposite the coil; studies have shown that they have a dramatic impact on mold proliferation, reducing the formation of mold colonies by more than 99 percent. They learned that UVC attacks mold at its source, the cooling coil,



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by bathing the coil continuously in germicidal energy.

Thus armed with the information, the board brought in Steril-Aire Inc. The first step was to install the devices in a dozen fan coils to test their effectiveness. The makeup air units serving the two towers were also equipped with UVC at that time, to ensure that the air entering from the rooftop intakes would be as clean as possible.

At the time of the installation, the maintenance department photographed the coils and took mold samples for analysis by an independent lab. Three months later, additional photo documentation and mold testing were performed. Before-and-after petri dish sampling measured 99-plus percent reductions in mold counts on the test units. Photographs provided further visual evidence of the improvement; coils were noticeably cleaner, free of mold and organic buildup that had been present before. Residents also reported reductions in asthma and allergy symptoms.

## AUDIT, FINAL PLANNING

“By the conclusion of the test period, we were convinced that UVC lights were an excellent solution, but we also believed that the lights could only perform at their best if the fan coils were in proper working order,” says Wigley. “This was to be the first installation of its type in Canada, so we really wanted to do our homework.”

The board brought in Climanetics Inc. (Vaughan, Ontario), an HVAC service company specializing in high-rise condominiums, to perform a complete audit of the project. This audit included detailed study and photo documentation of all 1,240 fan coils, as well as an evaluation of what had to be done to restore each unit to good operating condition. The findings of this exhaustive survey filled eight 4-inch-thick binders.

“The audit provided us with a detailed roadmap of the required work and the projected costs,” Wigley reports. “Using this information, the board voted to approve the retrofit project for the 2008 financial year. We were able to use monies from the reserve fund to finance the work, an important point since it allowed us to make the necessary improvements without raising maintenance fees.”

## PRODUCTION-LINE INSTALLATION

Climanetics began installing the UVC devices in February 2008 and completed the project about eight weeks later. The fan coil kits include UVC Emitters™ in the specified lengths, along with the hardware components needed for these installations. Each unit required one 12- or 16-inch length UVC Emitter to cover the length of the coil.

Sergio Colalillo, vice president of operations for Climanetics, reported, “We retrofitted every suite in the two towers with UVC, except for the units that had already been equipped with the lights during the test program. We coated the drain pans with rust-inhibiting waterproof paint on all units. We replaced drain hoses and insulation on an as-needed basis, and repaired any control valves or thermostats that were not working properly.”

Colalillo said that the total scope of work averaged about two man-hours per fan coil and was performed using a production-line strategy. “We had a crew of five, and each person had a specific task to perform over and over as we went through the building, floor by floor,” he said. “This approach helped the work to flow much more efficiently.”

“Since we could not access the suites without the consent of residents, it was a monumental task to orchestrate approvals for entry,” Colalillo continued. “The logistics for all this were handled very ably by Brookfield Residential Services. With the help of their organizational skills, we were able to complete the work on time and on budget.”

The total price tag was \$600,000-\$700,000, about 25 percent of the cost if the board had used the alternative approach that was originally considered.

Going forward, Climanetics will return once a year just prior to cooling season to change the filters, replace the UVC Emitter tubes, and perform a general cleanup. The contractor tailors its main-

tenance strategies to each customer’s needs. An in-house maintenance crew will do a supplementary autumn filter changeout in between the annual service cycles. Colalillo noted that they use a tacky media filter that offers a higher arrestance rate and better dust-removal ability than standard fan coil filters.

He added, “Fan coils, like all mechanical systems, have a limited life span — usually 25-40 years, depending on how well they are maintained. The work we did at Number One York Quay will add many years to the life expectancy of these units and save money over time.

“UVC is a huge contributor to this rejuvenation by keeping the coils in a perpetually clean state. When coils and other components stay clean,” he explained, “longevity is not the only benefit. Heat transfer is improved and the units operate more efficiently. As a result, HVAC systems equipped with UVC typically use 10-20 percent less energy. The chillers and boilers serving the complex will also run more efficiently.”

## RESULTS

“The board has received many positive comments on the air quality, particularly among residents with asthmatic children,” said Wigley. “We have heard reports of reduced allergy and asthma symptoms from several sources.”

The board recognized that mold abatement is just one benefit. As the fan coils are designed to recycle the air four to six times per hour, the air coming out of the a/c unit is 99 percent free of viruses and bacteria after an hour’s operation.

UVC also is proving to be a useful marketing tool for owners who wish to resell or lease their suites. “Lots of places offer fitness clubs and pools, but the use of UVC to enhance air quality is fairly novel and appeals to a certain type of buyer,” said Wigley. “It also shows that the board and residents here take a proactive approach. Recognizing this, some of the sellers in the complex are mentioning it in their advertisements.”

What advice would Wigley offer to other condominium boards considering UVC technology? “We recommend a full audit as we commissioned at Number One York Quay. We are great believers in UVC technology, but it isn’t a cure-all for every single problem in an air conditioning system, especially with older equipment. An independent evaluation of the total system can be very helpful.”

He added: “Keeping to a changeout schedule is also vital. Even though a UVC light may still be shining, after a year it loses output and effectiveness. Annual replacement of the bulbs or tubes is necessary to prevent mold and other contaminants from building up in the coils again. Bulb replacement is a necessary expense but, fortunately, the cost is quite modest.” ■

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