

HEATING • COOLING • REFRIGERATION • CONTROLS

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Vol. 15 No. 4 April 1998

Engineered Systems®

BNP Business News Publishing Company

\$6.95



**What are we doing
to our children?**

PRACTICAL APPLICATIONS FOR INNOVATIVE HVACR MECHANICAL SYSTEMS ENGINEERS





case in point

Ultraviolet lights 'zap' mold problem at Hawaii school

Hawaii is home to some very old traditions, but when Honolulu's Iolani School faced a potential mold-growth problem, it employed a new twist on existing technology for a most modern solution.

The private school's 1,800 students had not experienced abnormal amounts of allergy or asthma problems. Nonetheless, "We needed to find a more effective way to control mold in this building's air handlers," said Glenn Ching, Iolani's director of finance.

School officials received a tip from Hawaiian Electric Co., Inc.: ultraviolet light. The use of UV light as a germicidal agent is not new in itself; the restaurant industry has increased food safety with UV lights for years. However, this was not a practical tool for IAQ experts until recently, when new applications designed specifically for hvac operating conditions made it a more viable option.

Iolani selected UVC Emitters™ manufactured by Steril-Aire, Inc., Cerritos, CA. When installed in air-handling systems around coil and drain pan areas, these devices emit high-output UVC energy that, according to the manufacturer, "zaps" surface mold, airborne allergens, viruses, and bacteria.

GOOD INTENTIONS

Iolani School was originally designed with cost efficiency in mind. It was tightly constructed, with sealed windows and a high percentage of recirculating air.

"Twenty years ago, buildings were designed this way for reasons of energy conservation," explains Ching. "But as IAQ experts now know, such designs can cause indoor air quality problems if remedial measures are not taken."

Iolani officials had tried this route before, and the bill was steep.

"To clean up mold and prevent it from spreading through the air handlers, we had to spend \$8,000 a year for coil cleanings,"

states Lloyd Stern, maintenance superintendent at the school. "Shortly after every cleaning, however, mold buildup would begin anew."

PLUGGING IN

To address the problem, Iolani School agreed to let Hawaiian Electric test the effectiveness of the UVC lights in a 6,500-cfm air-handling unit, the smallest of five air handlers in the building.

Hawaiian Electric commissioned an independent testing laboratory, Food Quality Labs, Honolulu, to conduct before-and-after mold counts in the test unit. Five mold samples were taken from the air handler, and five more samples were taken just a few days after the UVC Emitters were installed.

Food Quality Labs reported that the "before" samples contained an average of 2,087 colony-forming units per milliliter (cfu/ml), indicating high levels of mold growth in the air-handling system. By contrast, the "after" samples contained an average count of 26 cfu/ml — a 99.8%

reduction. These figures were borne out by visual inspection.

"When I examined the system a few days after installation, I was amazed by what I saw," says Stern. "The coil was so clean, it looked as though it had just come from the factory. So in a sense, we received an immediate payback on our investment."

Based on these impressive results, Stern ordered a total of 26 UVC lights for the building's four remaining air handlers, which vary in size up to 12,500 cfm. Since the lights arrived preassembled and prewired, a system could be installed in about half an hour, according to Stern.

"When the lights were first activated, we briefly noted an odor as the UVC energy literally 'cooked' the mold," he explains. "Within short order, however, the lights started to produce a very clean, fresh-air smell."

He has chosen to run the lights around the clock to speed initial mold eradication, but he generally plans to run them in conjunction with the school's existing air conditioning system. Stern estimates the lights will need to be replaced annually. **ES**



The main building at the Iolani School, Honolulu, where UV lights help control mold and improve the quality of indoor air.