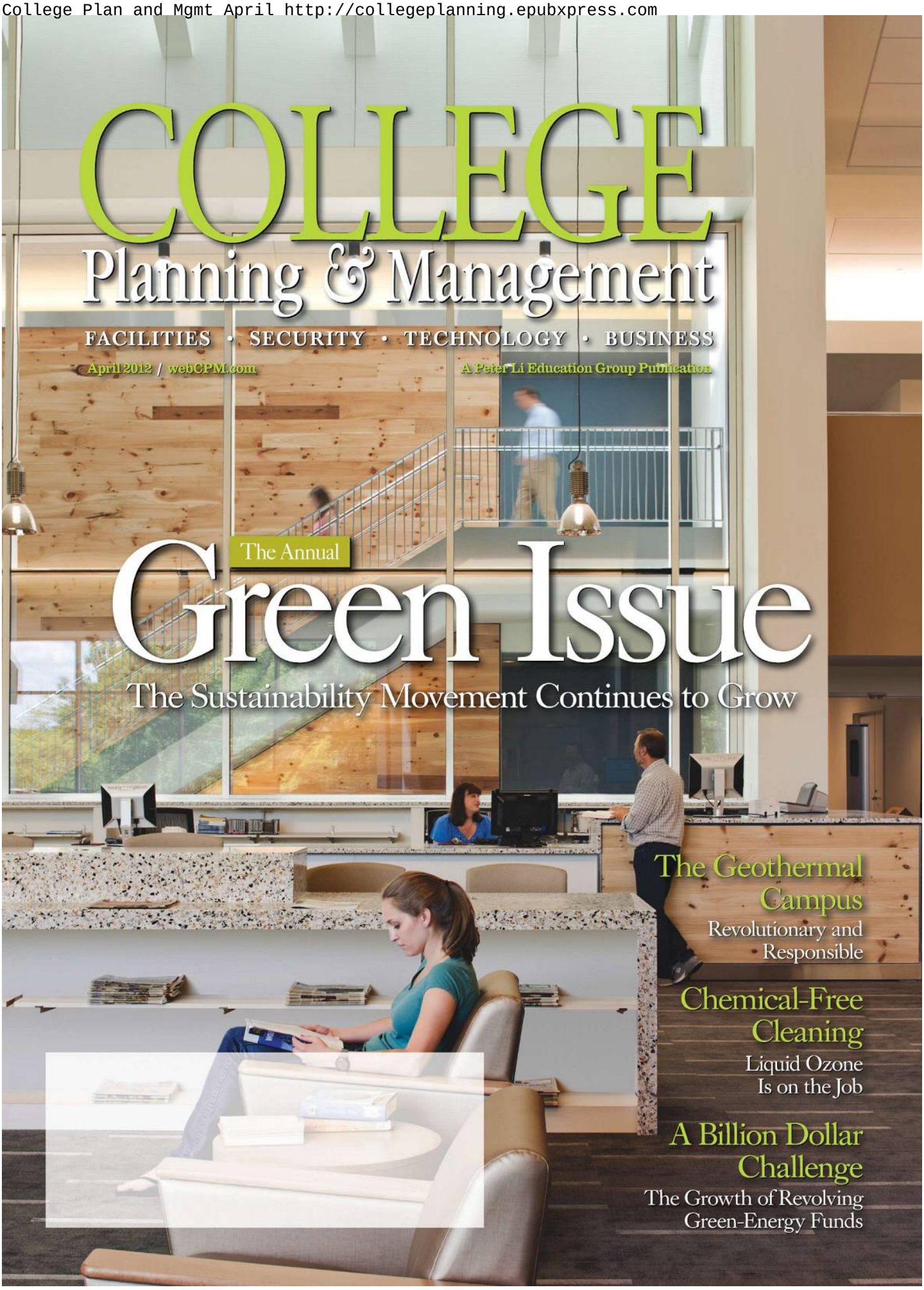
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Chemical-Free Cleaning

Liquid ozone offers a sustainable, economical cleaning solution for the University of Michigan.

BY KYLE SWANSON

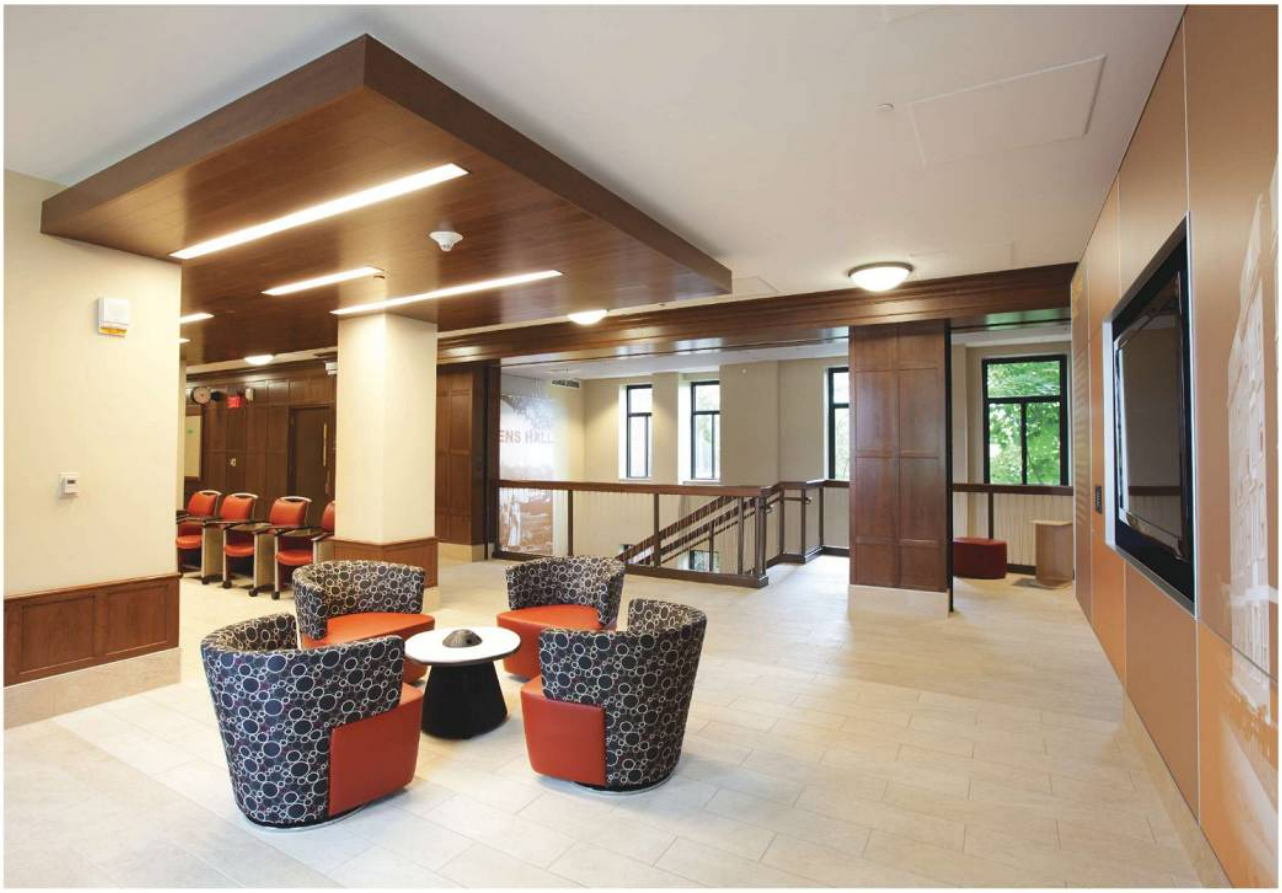
UNIVERSITY OF MICHIGAN Housing is phasing out many chemical cleaners from its maintenance closets and replacing them with liquid ozone — the first university in the country to do so. Liquid ozone cleaning works — it's more sustainable, less expensive, safer, and as effective at cleaning as chemical agents.

Liquid ozone cleaning is not a new technology, having existed for more than 75 years. In fact, liquid ozone cleaning has long been used to clean swimming pools used in the Olympics. Many municipalities in the United States and Europe also use the technology to sanitize drinking water… including the City of Ann Arbor, home to the University's main campus. However, the technology has only recently become practicable for use in smaller applications, such as cleaning residence halls on campus.

The Science Behind Liquid Ozone

Introducing an extra oxygen atom to an oxygen molecule and water molecules creates liquid ozone. At the University of Michigan (U-M), the liquid ozone is actually produced onsite with the use of special equipment that introduces the additional oxygen atom into the regular water. The instability of the third oxygen atom creates a high-quality cleaning agent in which atoms of oxygen search for something with which to bond. As they search, the oxygen atoms break up dirt bonds and combine with hydrogen and oxygen to create more molecules of water and oxygen, while cleaning the surface in the same way as toxic cleaners, but naturally.

U-M's University Housing staff piloted liquid ozone cleaning at South Quad in October 2010, and it is now also being used at Mosher Jordon, Stockwell, North



NO CHEMICALS, NO PROBLEM. The University of Michigan has a rich history of operational sustainability on its Ann Arbor campus, encompassing a broad array of opportunities including energy management, transportation, waste reduction and disposal, custodial services, the construction and renovation of facilities, storm water management, and the physical operation of its facilities, including its residence halls. In accordance with these efforts, U-M is successfully replacing the chemical cleaners in its maintenance closets with on-site created, chemical-free liquid ozone.

Quad, Couzens, and Fletcher residence halls. Plans are underway to implement the technology at all residence halls, including Alice Lloyd, in fall 2012, and East Quad in fall 2013, when renovations of the two buildings are complete. Liquid ozone cleaning is also being implemented in other buildings on campus, including the Michigan League union, where it was rolled out in February.

Testing Before the Roll-Out

Joseph Kennedy, assistant director of University Housing facilities, notes that extensive testing was conducted before liquid ozone technology was implemented in residence halls. As part of the pilot program proposed by Kennedy and Sally Gonzales, a building facilities manager,

LIQUID OZONE IS MORE SUSTAINABLE THAN CHEMICAL CLEANING AGENTS BECAUSE, ONCE USED, LIQUID OZONE REVERTS TO WATER AND OXYGEN MOLECULES, LEAVING ONLY A BUCKET OF DIRTY WATER TO BE POURED DOWN THE DRAIN. AND UNLIKE CHEMICAL AGENTS, LIQUID OZONE DOES NOT LEAVE A RESIDUE ON CLEANED SURFACES.

swab samples were taken before and after cleaning surfaces to compare the effectiveness of liquid ozone to that of chemicals.

"We wanted to test it in one residence hall first to make sure switching to liquid ozone would make sense for us," Kennedy says. "Once we observed that liquid ozone sanitized just as well or better than the chemicals we had been using, the sustainability and financial benefits made it an easy decision to keep rolling this out across campus."

Liquid ozone is more sustainable than chemical cleaning agents because, once used, liquid ozone reverts to water and oxygen molecules, leaving only a bucket of dirty water to be poured down the drain. And unlike chemical agents, liquid ozone does not leave a residue on cleaned

surfaces, making it safer for custodians and residents with skin sensitivities that may be aggravated by chemical residues.

"University Housing has long been committed to creating safe, sanitary living conditions for students living in the residence halls, while trying to be as conscious of our environmental footprint as possible," Director of Housing Facilities Vicki Hueter says. "Liquid ozone is allowing us to take this commitment to an entirely new level by eliminating the need for most of the chemicals we used in the past."

Safe, Effective, and Economical

In addition to being an effective and more sustainable cleaning agent, liquid ozone is also much more economical than using chemicals. It is expected that nearly $50,000 will be saved in chemical expenses each year, once the system is fully implemented at all residence halls.

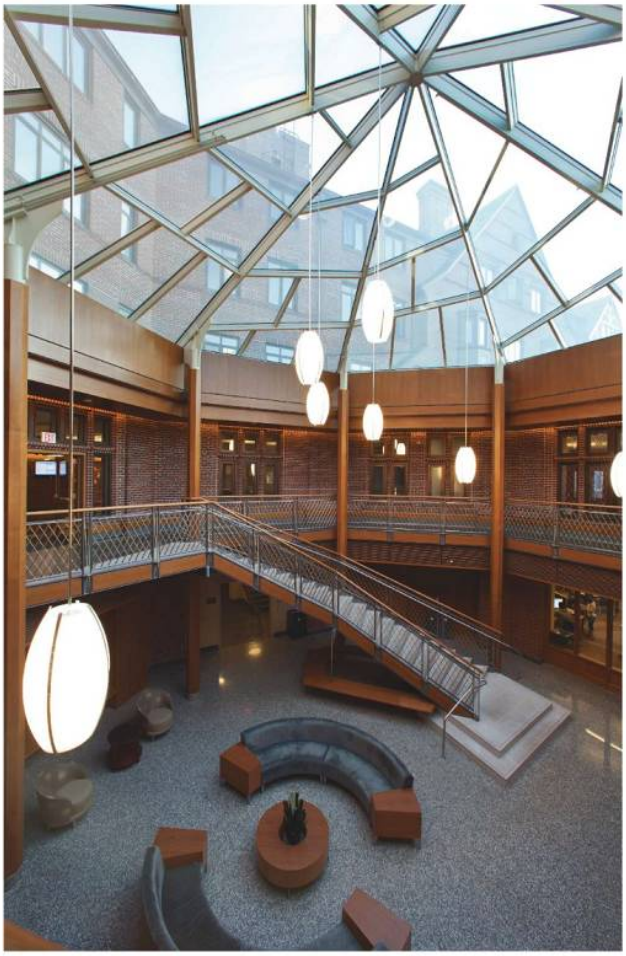
"It's really quite amazing how simple and effective liquid ozone is," Hueter says. "Liquid ozone requires electricity to add oxygen molecules into water, but that's about it. After we've purchased the liquid ozone machines, there will be almost no recurring costs."

Gonzales adds that U-M has now become a role model for other Big 10 schools interested in implementing the technology in their custodial operations.

"We've had a lot of interest from other schools about how we're using liquid ozone to clean our facilities," she says. "Ohio State and Harvard have each made inquiries, and Michigan State came for a site visit and had their custodians shadow our custodians."

Dave Camp, a custodian who was involved in the piloting process, says he was originally skeptical about using liquid ozone instead of chemicals when cleaning; but he's seen a remarkably positive impact from the switch.

"Sustainability is a big thing at the University; everyone talks about it, but with liquid ozone cleaning, we're really living it too," Camp says. CPM



CHECK OUT WHAT WE'VE DONE HERE. The University of Michigan is the first university in the country to phase out chemical cleaners in favor of liquid ozone as a cleaning solution. In doing so, U-M has become a role model for other schools interested in integrating the technology and process into their own custodial operations. The liquid ozone solution has been an overwhelming success for U-M.

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