By Haley Jorgensen

Missouri Prisons Going Green and Saving $1.2 Million Yearly with Ozone

Missouri is expected to save $1.2 million per year in natural gas, water and sewer costs simply by improving energy-efficiency at 15 correctional facilities statewide. During 2007, Aqua-Fusion Ozone Systems were added to each facility's on-premise laundry as part of Gov. Blunt's directive to pursue areas of energy conservation. The savings are staggering, according to Tom Schmidt, director, Energy Management Office, Missouri Administration Facilities Management, Design and Construction.

Ozone Energy Savings and Return on Investment

"There's a tremendous amount of energy involved in laundry processes," says Schmidt. By adding ozone technology to its on-premise laundries, Missouri's corrections industry saves energy, improves wash quality and ensures a superior microbe kill rate, according to Schmidt. Moreover, the state is expected to realize an average return on that investment within 14 months, according to Bill Kimmel, president at RJ Kool Co., in N. Kansas City, Mo. A distributor of laundry and drycleaning products, RJ Kool piloted, sold and installed the Aqua-Fusion ozone systems statewide. "The majority of the prisons will achieve a full return on investment in under 12 months," says Kimmel. "Some will take as long as two years."

After that, Missouri just saves …

What is Ozone?

While ozone technology has been around for a while, not all ozone systems allow for precise control over the amount of ozone injected into the laundry process, according to Schmidt. Total control over ozone amounts is critical, he says, in order to achieve a high microbe kill rate, superior efficiency and a quality clean.

As the manufacturer of the Aqua-Fusion System, Aqua Wing Ozone Injection Systems (AWOIS) LLC, maintains its product eliminates 99 percent of super bugs in the wash. Super bugs are bacteria that are resistant to the antibiotics used to treat them. "The system has been clinically tested by two independent organizations and proven to kill over 99 percent of the super

bugs," says AWOIS Vice President Brett Daniels. "It's the only ozone product on the market to my knowledge that can clinically validate that claim."

As a result, the system helps prevent the spread of infections caused by super-bug bacteria and many harmful viruses, including but not limited to Hepatitis, C.diff, aspergillus niger, HIV and MRSA. While chorine bleach can only be utilized in the wash cycle, ozone's oxidation power is utilized whenever water is present. It is a powerful and natural biocide – destroying bacteria, deactivating viruses and controlling odors.

How does ozone technology work?

Ozone gas (O3) results from a high electrical voltage or ultraviolet light being passed through oxygen (O2) molecules. It's the addition of the third oxygen atom in ozone that produces a powerful cleaning agent.

"The most effective way to create ozone for laundry applications is to use corona discharge, a method that passes dried, oxygen-containing gas through an electrical field," says Daniels. This is the same technology used to purify drinking water in Los Angeles, Dallas and Las Vegas, for example. "The electrical current causes the oxygen molecules to split. Corona discharge is more effective than using ultraviolet light," he adds, "because ultraviolet light is incapable of producing ozone in sufficient quantities to overcome the oxidation demand of the soiled linen and can leave residuals like MRSA."

During a wash cycle, that third oxygen atom attaches to and breaks down organic materials like soils, bacteria, molds and greases. Once broken down, these materials are easily removed from fabric by detergent in the wash cycle. Ozone works best in cold water and can completely eliminate a laundry's need for hot water – reducing the workload and gas consumption of water heaters. Since ozone leaves only oxygen behind, it is also environmentally friendly.

Cuts Water, Chemical and Sewer Costs

Through ozone technology, laundries cut water, gas and sewer costs, while extending linen life, according to Director of Engineering Dave Spofford at AWOIS, in Auburn, NH. Ozone technology goes a step further to boost laundry productivity because its use eliminates steps in the wash process.

“It isn’t unusual to cut water consumption by 30 percent by eliminating flushes at the beginning of a wash cycle, or rinses at the end of a wash cycle,” says Spofford. Ozone requires less chemistry (detergents, bleach, softeners), and because of this, fewer chemicals are left in linens making them easier to dry. In combination, this shortens the time it takes to complete laundry. And, when dry-time is curbed, linens experience less wear – lasting longer. “Anytime you eliminate rinses and pre-washes, the wash cycle becomes shorter,” says Spofford. “Ozone typically cuts dry-time by 20 percent.”

Pilot Testing

In Missouri, the Aqua-Fusion system was piloted at several prisons, including Farmington Correctional Facility, where 35,000 pounds of laundry are processed daily. “The savings will be around $246,000 per year at that facility alone,” says Kimmel.

While some of the laundry managers were skeptical during the pilot, according to Schmidt, in the end, they were impressed. At one prison, clothes and towels slated to be thrown away because of stains and odors, were given one more chance to avoid death row. “They took them, put them in the ozone wash, and salvaged more than 60 percent of them,” says Schmidt. “That laundry manager was very pleased.”

During yet another test, a laundry manager washed mop heads. One load of mop heads was cleaned in hot water; the other load was cleaned using ozone and cold water. “She compared both groups with new mop heads and couldn’t tell the difference between the ozone-washed mop heads and the new ones. The others washed in the hot water were gray,” says Schmidt.

Laundry managers also found that ozone-washed items smelled better. Wool blankets pulled out of the washers didn’t smell like wet dog anymore, attests Schmidt, and housing units smelled fresher too. This, he says, is because ozone removes body odors and bacteria more effectively than traditional hot-water washing.

Results Speak for Themselves

Thanks to ozone technology, Missouri correctional facilities are saving money, time and energy. “We don’t have all the results yet, but the energy savings we’re seeing are significant,” says Schmidt. Now, the only time hot water is used in the laundry process is when items contaminated

with hazards such as blood and bodily fluids are cleaned in self-contained bio bags. The bio bags dissolve in hot water during the wash process, ensuring no one makes contact with the contaminated items inside.

Missouri is on track to save $6 million over the course of five years in gas, water and sewer costs thanks to an environmentally friendly system that pays for itself in 14 months.

Ozone – in Missouri – is turning heads and opening eyes, according to Schmidt. In the future, it's likely other state-funded facilities will embrace the technology.

To find out more about ozone technology, visit www.awois.com.