

Environmental Improvements in Laundry Equipment and Products

Sarah O'Brien, Hospitals for a Healthy Environment

Laundry is an essential function for all institutional housekeeping departments, but in health care facilities, laundry plays an even more important role -- not only contributing to comfort and aesthetics, but also assisting with infection control. Because of its high level of energy, chemical and water consumption, laundry processing also has a significant impact on hospitals' environmental and financial bottom line.

Like any department, laundry services must continuously find ways to increase efficiency and decrease costs. Purchasing and Materials managers may be involved with decision-making about purchasing new laundry chemicals and technologies, so it makes sense to be informed about laundry innovations. Several developments in laundry technologies and products have enabled laundry managers to cut energy and water use significantly and to reduce the impact of laundry chemicals on the environment.

Many healthcare facilities have decided, for reasons of space, or economies of scale, to outsource laundry functions, yet a significant proportion of facilities still manage laundry on-site, or through a central laundry owned and operated by their health system. When analyzing the financial viability of in-house laundry facilities, it is important to consider facility upgrades as a possible means to saving money and improving environmental performance while maintaining control over laundry processing. Assessing the comparative environmental and cost impacts of transportation for pickup and delivery of linens is also important. But whether laundry services are outsourced or handled in house, implementation of innovative programs and technologies can reduce environmental impact and should be promoted through service agreements or purchasing specifications.

Energy and Water Usage

One H2E Partner, Covenant Healthcare, a member of the Wheaton Franciscan Services health system (an award-winning H2E Champion for Change), has incorporated an array of innovative technologies in their new laundry facilities in Milwaukee. Covenant processes 13 million pounds of laundry per year for a total of 34 different facilities in their own system and several other Wheaton Franciscan system members in Wisconsin. They launder a wide array of materials from a variety of health care sites – from acute care hospitals to nursing homes to surgical centers. As they designed and built their new facility, Covenant incorporated numerous features to increase the efficiency of their operations, lower costs, and reduce environmental impact.

To reduce water usage, Covenant purchased continuous batch washers which recycle rinse water into washwater – significantly reducing water consumption. At the same time, they installed a heat reclamation unit which strips heat from outgoing washwater and uses it to preheat the incoming water. With this system, they are able to heat the incoming

water from an average of 50 degrees to around 100 degrees solely through the reclaimed heat from outgoing wastewater, significantly reducing the energy (in this case natural gas) used to heat washwater.

The heat reclamation unit hangs from the wall, so it does not require any allocation of floor space; the only additional space required for this system is for a tank to hold water as it is being bled into the reclamation system. Covenant was lucky to be building in a facility with an underground storage tank area, which is used for this purpose; those lacking such an underground space would need to find floorspace for a tank. To save additional energy, the dryers Covenant installed in the new space work in a similar fashion to the washers – using outgoing air to heat the incoming air.

Because the facility was new, Covenant does not have a baseline energy usage figure for comparison, but comparing average fuel consumption rates per pound in conventional laundry processing, heating with natural gas, they estimated that the water heat reclamation unit would pay for itself in approximately three years. (With the current rapid increase in energy costs, that return-on-investment interval may be considerably shorter now and in future!)

When considering purchase of new laundry machines, ask vendors to supply energy and water consumption figures for all models under consideration. To ensure you are comparing apples to apples in any new purchasing program, these should be provided in uniform fashion – either as the average KWH per year figure used for Energy Star consumer labeling programs, or through use of the federal government’s new Modified Energy Factor, which accounts for both the energy directly consumed by the machine and the amount of energy that will be required to dry materials after washing in a given machine. Also ask about efficiency features such as G-force of the spin cycle for better water removal (which reduces drying time), or drum sensors that measure contents’ humidity to precisely stop cycles when materials are dry.

Laundry Chemicals

Each year, laundry detergent formulators use billions of pounds of chemicals, many of which are toxic to aquatic organisms. Almost all of these chemicals are released into the environment in wastewater. Several initiatives are aimed at reducing the environmental impacts of cleaning chemicals.

US EPA’s “Design for the Environment” Industrial and Institutional Laundry program works with product formulators to reduce the toxicity and increase biodegradability and other positive factors of laundry products. The DfE program ‘recognizes’ products formulated from chemicals that meet specific criteria identified as beneficial by the program, with a product list available at <http://www.epa.gov/opptintr/dfe/pubs/projects/formulat/formpart.htm#iil> . You may wish to ask manufacturers or vendors to report whether they or their contracted formulators participate in this program, and whether their products employ chemicals that meet the criteria, as one way of vetting any claims they make about their products’ “environmentally friendly” qualities.

In addition, the Canadian government's Environmental Choice certification program applies specific environmental criteria to laundry detergents and fabric softeners. Though only a few products are already certified under this standard, you may wish to ask your vendors to demonstrate whether their products meet the program's criteria, which are listed at http://www.environmentalchoice.com/images/ECP%20PDFs/CCD_105.pdf.

Ozone

In addition to the growing array of energy and water conservation tools available to modern laundry facilities, an increasing number of institutional laundries are adapting ozone treatment as an adjunct to conventional laundry chemicals and methods. The same disinfection power that has made ozone a popular choice for purifying drinking water and swimming pools and treating cooling tower water, makes it a useful addition to the hospital laundry in particular.

Ozone laundry systems work by injecting O₃, or ozone, a form of oxygen, into washwater. The O₃ molecule breaks down rapidly, oxidizing the fatty oils that cause dirt to bind to cloth, disinfecting water and bleaching linens as it does so. Ozone's only breakdown by-products are oxygen and water. Because it involves no chemical residues in fabrics, it requires less rinsing than other bleaching agents.

Ozone technology promises better deodorization, shorter laundry cycles and improved sanitation, all with the use of lower temperature water, which saves on energy consumption and costs. Ozone is a stronger oxidizer than chlorine bleach, and has been shown to be a highly effective disinfectant – it is even used in sterilization systems. In addition, ozone generators can be installed as an add-on to conventional systems, which enables older laundries to adapt their facilities without replacing costly machines. Water and sewer consumption can be reduced significantly – between 15 - 25% -- by the adoption of ozone technologies, and energy costs are lessened by the reduction in hot water usage. Washing at lower temperatures can help extend the life of frequently laundered linens, and users consistently report that linens are fluffier and softer than those bleached with chlorine.

Numerous nursing homes have adopted ozone laundry systems, as have hotels, prisons and hospitals. Users' testimonials evidence their satisfaction with the system's whitening abilities, disinfection properties and significant cost savings over conventional laundry.

A few caveats concerning ozone laundry systems – ozone can speed up the normal break down of rubber seals and pipes, so some laundry equipment may need to be adapted for systematic use. And ozone can present an indoor air quality issue if there is a leak into the laundry room, though except at very high concentrations, it does not present an acute health hazard. Since ozone is created through the use of an electrical charge, its generation can be stopped immediately if any leak is perceived. A standard laundry ventilation system should be able to flush any excess ozone levels in short order, and a well-functioning system should not release ozone to the indoor environment.

Conclusion

Environmentally sound, cost-saving technologies are available for use in laundry operations of all sizes. Whether reviewing the case for off-site processing, building a new laundry facility or considering upgrades of existing on-site facilities, they should be part of the equation for any laundry manager. As in many other areas, saving money and improving environmental performance in the laundry can go hand in hand.

For more information:

Energy Star Commercial Clothes Washers listings

http://www.energystar.gov/index.cfm?fuseaction=clotheswash.display_commercial_cw

DfE Industrial and Institutional Cleaners

Project Information <http://www.epa.gov/opptintr/dfe/pubs/projects/formulat/index.htm>

Lists of formulator chemicals and their environmental effects can be found at

<http://www.epa.gov/dfe/pubs/projects/iil/findings.htm>

Partners and recognized products:

<http://www.epa.gov/opptintr/dfe/pubs/projects/formulat/formpart.htm#iil>

Terrachoice Ecolabel Criteria for laundry products

<http://www.environmentalchoice.com/English/ECP%20Footer/About%20Us/Criteria/Cleaning%20and%20Janitorial%20Products/Cleaning%20Products/Liquid%20Laundry%20Detergent%20and%20Fabric%20Softeners>

Nursing Homes, February 2003 article “Does Ozone Laundry Really Work? A User’s Report”

http://www.findarticles.com/p/articles/mi_m3830/is_2_52/ai_98033895