Implementing a Green Floor Care Program
Introduction

In recent years, the professional cleaning industry has made giant strides in converting from conventional products to environmentally responsible cleaning tools, chemicals, and equipment. “Green” product equivalents for everything from window cleaners to harsh degreasers have been certified by such leading organizations as the U.S. Environmental Protection Agency’s Design for the Environment (DfE), GreenSeal® and EcoLogo™ and are available to both consumers and professional users.

According to Stephen Ashkin, an industry leader in the green movement, and President of The Ashkin Group, the goal of these cleaning products is to reduce the impact cleaning has on workers, building occupants, and the environment. Put another way, Green Cleaning also seeks to employ products that reduce the impact on human health and the environment when compared to similar products used for the same purpose.

Ashkin also believes that Green Cleaning is beginning to move beyond safe products and is now evolving to promote sustainability* as well. This means, among other things, that the products, tools, and equipment used should be derived from renewable resources and packaged in recyclable materials and that cleaning procedures should minimize the use of nonrenewable resources.

Many of the goals that Ashkin has described have been reached for most cleaning procedures. But problems still persist in one key area—and unfortunately, it is often the largest area in a facility—the floors. Manufacturers in the janitorial industry (jansan) have encountered considerable difficulty producing Green equivalents for such things as chemical strippers, glosses, and finishes.** For example, conventional floor finishes typically contain zinc and other metals. These help produce the shine that end users desire; however, we now know that these metals can harm the environment, the user, and building occupants, and that they can also interfere with wastewater treatment processes.

Another concern is the equipment used to perform floor care tasks. Many conventional floor care machines use large amounts of water and chemicals, are difficult to use even for experienced users***, and can produce considerable amounts of waste.

Fortunately, new technologies and a new generation of equipment are helping to make floor care more environmentally responsible and sustainable as well.
A Closer Look at the Issues

To fully understand Green Cleaning in general, Green Floor Care in particular, and why they are both so important, one must take a closer look at the environmental impact of floor care. The following are just some of the concerns raised by the use of traditional cleaning products and practices:

Public health risks. Environmentally sound building operating procedures are essentially a public health issue. Facilities that harm the environment because of the way in which they operate may cause people to become ill. Managers that practice Green operating procedures can improve the overall health of not only their own facilities but the larger community of which they are a part.

Occupant health risks. A positive building appearance and overall cleanliness is a basic tenet of building operation. However, to achieve this through the use of harsh chemicals runs counter to another basic tenet of building operation: protecting human health. Green Cleaning practices help reduce the adverse impact of many cleaning tasks while still maintaining the appearance and cleanliness of a facility.

User health and safety risks. Harsh cleaning chemicals can be harmful to custodial workers, who must use these products on a daily basis. In fact, according to a report on the PBS television program Frontline, “The public is generally misinformed about the job hazards involved in such occupations as janitors.” Being a janitor is also “high on both the total and per person cost list” when it comes to work-related injury expenses. Many of these injuries are the result of cleaning chemicals.

All of these concerns and more are amplified when it comes to floor care. For instance, many chemicals historically used in floor care products have included ingredients that:

- Are known to be both carcinogenic or to contain toxins that can harm reproductive health.
- Contain zinc or other heavy metals that may negatively influence human and animal health and may even be toxic.
- Have more than 7 percent volatile organic compounds (VOC) after dilution with water. VOCs are gases that may have short- and long-term adverse health effects.
- Contain such ingredients as aqueous ammonia, ethylene glycol monomethyl ether (EGME), and/or ethylene glycol monoethyl ether (EGEE), which are irritants to the skin and eyes and can damage internal organs.
- Have a total phosphorous concentration of more than 0.5 percent.
- Contain 2-butoxy ethanol, a chemical common in many conventional strippers, that can be absorbed through the skin and damage the liver and kidneys.

With this information in mind, the first step in Green floor care should obviously be selecting chemicals that have been certified Green—meaning they have been independently tested and proven to be free of these potentially harmful ingredients. And, since many of these ingredients are derived from nonrenewable resources, choosing Green products is more sustainable as well as more environmentally responsible. Or, if none of these products meet performance standards, managers and cleaning professionals can also try to:

- Select chemical products with a pH no higher than 11.5 and total phosphorous concentrations of less than 0.5 percent.
- Choose products with a flash point above 150 F.
- Avoid products that contain carcinogens, heavy metals, or aqueous ammonia.
- Select products that have total VOCs less than 7 percent after dilution.

Floor care products that are sold in the United States should include full disclosure information regarding these factors and should be supported by material safety data sheets (MSDS).
Green Automatic Scrubbing

The other key component of Green floor care is the equipment used. Fortunately, manufacturers have become increasingly successful at developing floor care equipment that has a reduced impact on the user and the environment and is also more sustainable.

One example of this is the development of cylindrical brush technology. First introduced in Europe, machines featuring this technology quickly became popular there because they are better than conventional rotary machines at adjusting to the floor-level discrepancies often found in older buildings. They are now becoming more commonplace in North America as well.

Cylindrical brush machines have two counter-rotating brushes on the base of the machine. These brushes rotate at about 600 to 1,000 rpms. They also have five to six times more contact pressure, compared to a conventional rotary machine.

The reduction of water and chemical use, sometimes referred to as low moisture floor care, is crucial to Green floor care. David Frank, President of the American Institute for Cleaning Sciences, believes low moisture floor care will become more commonplace in years to come. "The less water used, the better," says Frank. "This also means less chemical is typically necessary, which decreases dry times and is more cost effective, efficient, and environmentally responsible."

Independent tests have found that cylindrical brush technology uses as much as thirty percent less water than conventional rotary machines, and this usually means that less chemical is used as well. According to Ashkin, whenever less chemical is required to perform cleaning tasks, it contributes to Green Cleaning by reducing the impact cleaning has on the environment.

Cylindrical floor care equipment also addresses concerns regarding sustainability. The pads on rotary machines, which are usually constructed of nonrenewable resources, typically need to be replaced after each use; also, because they are produced by only a few manufacturers, they must be shipped over long distances, contributing to the production of greenhouse gasses and the use of imported fuel. Finally, these pads are simply discarded after use, meaning they end up in overflowing landfills. The brushes on cylindrical machines, on the other hand, typically equal 100 pads. This means fewer natural resources are used to manufacture them, they are less likely to end up in landfills, and they have less of an impact on the environment.

In addition to using cylindrical brush technology, Ashkin says equipment purchases looking to go Green when it comes to floor care equipment should look for:

- Powered floor maintenance machines (including electric and battery-powered floor buffers and burnishers) equipped with vacuum systems, guards, and/or other devices for capturing fine particulates
- Machines with sound levels of less than 70 decibels
- Automated scrubbing machines equipped with variable-speed feed pumps. Note: The units should also be filled using only a wall mounted chemical metering system or on-board system.
- Battery-powered equipment that uses environmentally preferable batteries
- Equipment that is ergonomically designed in order to minimize vibration, noise, and user fatigue
Greening Carpet Cleaning

In what may be one of the most important events affecting the professional carpet cleaning industry in decades, the Carpet and Rug Institute (CRI), Dalton, Georgia, has developed a new testing and “Seal of Approval” certification program for evaluating carpet cleaning extractors. The system uses X-ray fluorescent (XRF) technology to measure soil removal as well as the extractor’s effectiveness in recovering water from carpets. LEED supports this testing for carpet extractors and requires that machines are CRI approved through the Gold, Silver or Bronze classifications.

The certification criteria include high standards for water recovery because of the potential for mold to develop. Additionally, CRI believes too much water left in the carpet negatively affects its appearance and can damage carpet fibers.

The Seal of Approval program evaluates extractors based on the following criteria:

**Soil removal** — XRF technology is used to measure the precise amount of soil removed from the carpet after cleaning.

**Water removal** — The extractor must remove most of the moisture resulting from a wet cleaning process. Dirty water that remains in the carpet could be a source of fungal growth and could prolong the drying process.

Through a unique rapid recovery process that atomizes the carpet solution and controls moisture, some carpet extractors use a revolutionary, eco-friendly system that:

- Consumes less water, chemical and energy;
- Minimizes the development of mold, fungus and allergens in carpets;
- Delivers faster drying times so your space is clean, dry and ready for immediate use;
- Provides enhanced ergonomics with an optional lightweight, forward-push wand system for those hard to reach places.

**Appearance** — The extractor must not harm the carpet pile.

This program is important to facility managers and the environment for a number of reasons:

- It is encouraging manufacturers of carpet cleaning extractors to develop more effective cleaning equipment.
- The machines developed are helping extend the life of carpets, a major cost savings as they improve their appearance.
- The health of the consumer and both the indoor and outdoor environment is protected. Typically, these are more powerful machines with more effective moisture recovery. More chemical and moisture is removed from the carpets during the cleaning process with less chance of mold or mildew to develop.
Recycling Technology

Water is a highly valuable national resource and is in short-supply in many areas of the world. One-eighth of the world’s population lacks access to clean, fresh water to sustain life. In the United States, the per capita residential water usage is 8 times greater than that of other nations. It is critical that we minimize both residential and commercial per capita water usage to preserve and protect this precious resource.

LEED provides guidelines and credits for water efficiency and reduction in commercial facilities. By adopting the use of eco-friendly carpet care equipment used during the commercial cleaning process, significant environmental gains can be made. One technology that provides water-reducing benefits are units that clean or filter the cleaning solution and then recycle it, minimizing water and chemical consumption by 1/7th. The benefits of using “recycling” carpet extractors include:

- Reduction in chemical usage
- Reduction in water usage
- Reduction in waste water being dumped into the sanitary sewer
- Less transportation and storage related activities due to the reduction of chemical and water usage.

Low-Moisture Wand Technology

Units that incorporate low-moisture atomization technology within the extraction wand provide another way to control and minimize water that comes in contact with the carpet. A Rapid Recovery Atomization process occurring within the wand (pictured at right), cleans and recovers solution all in one step to ensure that moisture never rests on the carpet during the extraction process. The atomized, high-speed cleaning solution works as an agitator, deep-cleaning the fibers without damaging the carpet. This atomized solution is then recycled and used repeatedly to reduce water and chemical usage, and minimize moisture, mold, allergens, contaminants and odors that can reside in carpets. To get the same level of clean with a traditional extractor using a standard wand and hand-tool, you have to go over the same area three to four times!
Green Vacuuming

Facilities implementing Green Cleaning Programs must include environmentally responsible vacuum cleaners as part of their program. Specifically, LEED states that vacuum cleaners shall be:

- Certified by CRI
- Operate with sound level of 70 dBA or less

Nearly fifteen years ago, the U.S. Environmental Protection Agency (EPA) conducted a study that found proper maintenance and effective cleaning procedures reduce building airborne dust burdens in schools and other facilities by as much as 52 percent. Looking deeper as to how this was accomplished, the researchers found that the use of “quality vacuum cleaners with high-efficiency air filtrations systems” was at the top of the list.

Studies such as this laid the groundwork for establishing the Carpet and Rug Institute’s (CRI) Green Label program. Through independent testing, this program identifies vacuum cleaners that have a reduced impact by meeting the following criteria:

- **Soil removal:** The machine’s performance in soil removal is measured using NASA-enhanced X-ray fluorescence (XRF) technology.
- **Dust containment:** The vacuum cleaner must not release more than 100 micrograms of dust particles per cubic meter of air. It must also keep soils and contaminants locked within the vacuum, preventing them from escaping back into the air where they can be inhaled.

Typically this is accomplished through the use of HEPA filtration systems that trap more than 99 percent of all contaminants, preventing them from being released in the machine’s exhaust. Further, more advanced vacuum cleaners are often referred to as true-HEPA vacuum cleaners. This means the machine has been designed and engineered so that its casing is airtight. All dust and soils are contained within the machine.

And the results speak for themselves according to tests conducted by Lees Commercial Carpets, a leading manufacturer of commercial carpets and a division of Mohawk Carpets. The researchers found that using randomly selected CRI Green Label vacuums on carpet for only four minutes results in a tenfold reduction in airborne dust burdens compared to the use of non-Green Label vacuums.

The implications of these findings are quite significant. They mean that ten times less dust was released into the air; ten times less dust blanketed facility furnishings and fixtures. Less dust reduces cleaning needs, which can help reduce maintenance costs, and most notably as it relates to human health, ten times less dust is inhaled.
The LEED Connection

Because floor care can have such an impact on the environment, and because more and more facilities are seeking Leadership in Energy and Environmental Design (LEED) certification, the U.S. Green Building Council, which developed the LEED program, has established criteria and credits specifically addressing floor care equipment.

For instance, LEED-EBOM 6.5.2 (existing buildings, operation, and cleaning equipment maintenance) Credit 3.7 is awarded to those facilities that select and using floor care equipment that has a reduced exposure to building occupants and maintenance personnel of potentially hazardous chemical, biological, and particulate contaminants, which [can] adversely affect air quality, human health, building finishes, building systems, and the environment.*

The intent of these criteria, according to Ashkin, is to reduce floor care’s impact on the environment, including reducing water and chemical consumption. And because there is increasing evidence that environmental savings also translates to cost savings, selecting more environmentally responsible floor care chemicals and equipment can also help facilities reduce costs related to floor care tasks.

Foot Notes
* The word sustainability has become a widely used term and can mean different things in different settings and discussions. The word is derived from the Latin sustinere (tenere, to hold; sus, up). A simple yet widely accepted definition of sustainability is using natural resources in a way that meets the needs of today without sacrificing the needs of future generations.

** There are Green certified floor care strippers, glosses, and finishes available. However, their use has been met with mixed reviews. Some users believe the products are not cost effective, do not perform as well as the conventional products they are designed to replace, and are not as durable. Fortunately, most in the industry believe these problems are slowly being overcome.

*** In recent years, equipment that is considered easy to use, ergonomic, and has low decibel ratings has also been recognized as part of Green cleaning. This is because such machines have less impact on the health of the user, which improves worker productivity and morale.

Resources

Cleaning Industry Management Standard’s Green Building (CIMS-GB):
Sets forth a specific framework to ensure that the organization uses environmentally preferable cleaning practices.

Cost Analysis Tool:
Use this simple tool to show how much might be saved by going green. Answer some basic questions about your facility and you will get an idea of potential savings by going green.
Link: www.ofee.gov/janitor/buildinginfo.asp

U.S. Green Building Association:
The U.S. Green Building Council is a 501(c)(3) non-profit community of leaders working to make green buildings available to everyone within a generation.
Link: www.usgbc.org

Healthy Schools Campaign:
This advocacy group promotes healthier schools.
Links: www.greencleaningschools.org or www.healthyschoolscampaign.org

EPA Tools for Schools:
A program for schools to improve Indoor Air Quality.
Link: www.epa.gov/iaq/schools

The Carpet and Rug Institute (CRI):
Provides science-based facts about carpet and rugs and offers a Green Label certification program.
Link: www.carpet-rug.org/index.cfm
About Tornado

Tornado Industries, Inc. is dedicated to delivering "Best in Class" commercial and industrial cleaning equipment and after-sale service that meets and exceeds the expectations of our customers. In the industrial cleaning business for over 80 years, Tornado® has a strong entrepreneurial history of partnering with in-house cleaners, contractors and facility managers to provide cleaning solutions that deliver innovation, reliability and competitive pricing. Developed for cleaning professionals, by cleaning professionals, Tornado's machines are created to maximize cleaning efficiency and speed, minimize the impact of cleaning on indoor environments, and reduce the total cost of cleaning — all factors resulting in greater profitability for your organization. Tornado's industry-acclaimed products tackle the unique cleaning challenges faced in a variety of markets including:

- Hospitality
- Health care
- Industrial / Manufacturing
- Retail
- Education
- Food Service
- Building Service Contractors (BSC)
- Government
- Transportation
- and more

Commitment to the Environment

As an organization, we are deeply committed to creating a clean, safe and healthy workplace through the use of innovative cleaning technology developed to minimize the impact of cleaning on indoor and outdoor environments. Tornado® embraces core ecological and corporate values including water conservation, less use of harsh chemicals, improvement of Indoor Air Quality (IAQ) through the use of HEPA filtration and advanced filtration systems, and the use of components that are reusable and recyclable. We proudly support the standards and criteria established by the U.S. Green Building Council, The Carpet and Rug Institute’s (CRI) Green Label Certification program, EPA’s Design for Environment (DfE), among others.

For more information visit us at www.tornadovac.com or call 1.800.VACUUMS