

Yale University

Green Cleaning Standards

Developed by the *Facilities Services Department*

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Any questions or comments regarding this information should be directed to the Facilities Operations Support Center at 203-432-6888.**

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Objective

The purpose of this document is to present the framework for the Yale University green cleaning standards and practices. The standards outlined here are intended to reduce the exposure of faculty, staff, students, and visitors to chemical, biological, and particulate matter that may be harmful to human health, and the built and natural environments.

Our overall cleaning standards are based on LEED standards. LEED (Leadership in Energy and Environmental Design) is an internationally-recognized green building certification system developed by the U.S. Green Building Council (USGBC) (See Appendix C&D for more details). Other sources for our standards are Green Seal (GS) and the Carpet and Rug Institute (CRI) (See Appendix A&B for more details).

The LEED rating systems help building owners and operators measure operations, improvements, and maintenance on a consistent scale, with the goal of maximizing operational efficiency while minimizing environmental impacts. The LEED for Existing Buildings: Operations and Maintenance program (EBOM) is a certification program that addresses whole-building cleaning and maintenance issues (including chemical use), recycling programs, exterior maintenance programs, and systems upgrades. LEED Building Design and Construction (BD+C) is a certification for new or major renovation projects based on their design and construction. Both rating systems award projects for incorporating environmentally responsible and green cleaning practices into building operations and policies.

Our cleaning program is intended to comply with LEED 2009 EBOM Indoor Environmental Quality (IEQ) Prerequisite 3, which has established Green Cleaning Policy requirements for projects pursuing EBOM or BD+C certification. The green chemicals and tools selected under this standard are for routine cleaning. Where more aggressive cleaning of a non-routine nature is required, chemicals that do not meet this standard may be used. Examples of chemicals in this latter category are: floor finishes containing metal, strippers containing ammonia, red stain removers, metal polish, and ceramic tile cleaners. This approach complies with Green Seal GS37 and LEED 2009 EBOM IEQ Credit 3.3.

Leadership

Yale University's Green Cleaning Standards is a written document establishing how green cleaning standards are to be used, managed, and evaluated. The Yale University Green Cleaning Committee will maintain the Standards. The committee will also review and update the Standards annually. A Green Cleaning Program Manager (GCPM) is appointed by the Director of Facilities Services to chair the committee. The GCPM is responsible for the initiation, communication and compliance verification. The administrative and leadership requirements identified here are for LEED certified buildings or buildings pursuing LEED certification, as well as pertinent to all Yale University buildings.

Administrative & Management Requirements

Training

A training program has been written for Facilities Superintendents and cleaning and maintenance staff, who are responsible for implementing green cleaning procedures on a daily basis. The training program is to ensure staff understands the environmental and health issues associated with cleaning products and equipment, as well as their specific responsibilities for application and adherence of the policy. The curriculum covers the hazards, use, maintenance, disposal and recycling of cleaning chemicals, and dispensing equipment and packaging. This program also includes strategies for promoting and improving hand hygiene, including both hand washing and the use of alcohol-based waterless hand sanitizers. Hand washing instructions (See Exhibit 7) will be posted in custodial closets that have sinks. The training is conducted annually. All custodians and managers will be trained. The GCPM is responsible for updating the training program. Area Managers are responsible for training program delivery and compliance (See Green Cleaning Training: Exhibit 5).

Vulnerable Populations

Facilities Superintendents will provide the Business Manager for each of their buildings a list of the chemicals used in their building. This list is also posted in a prominent place in the building. The list includes instructions on who to notify if any occupants think that any of the chemicals may cause them undue discomfort. Facilities Superintendents will develop a list of building occupants who self-identify themselves that they may be susceptible to health problems from exposure to cleaning and maintenance chemicals. Facilities Superintendents are responsible for the maintenance of this list for their respective areas. Persons on the vulnerable populations list will be informed prior to any applications of cleaning, non-routine cleaning chemicals or procedures. To the best of our ability, these individuals will be accommodated with respect to cleaning procedures via frequencies, timing, product choices or some combination thereof.

Staffing Models

A staffing model for each building along with detailed cleaning schedules and tasks will be maintained. Schedules will include procedures for maintaining entryway systems, as well as exterior walkways. The Facilities Superintendents will maintain staffing models (See Exhibit 1) and cleaning schedules (See Exhibit 2).

Inspections

A plan for conducting routine inspections to evaluate the effectiveness of the cleaning program, using the Association of Physical Plant Administrators (APPA) standards as a guide, is in place. The University's target standard is a Level 2 (See Exhibit 8). Facilities Superintendents and their Custodial Team Leaders (CTL) will conduct routine inspections and maintain records of inspection results and the corrective actions taken (See Inspection Form example: Exhibit 6). A corrective plan is in place for any areas that fall below the target level of cleanliness. The plan includes the following:

Step One

Review the performance of the custodian to insure that procedures are being followed as specified. This is accomplished by observing the custodian as each task is performed. The custodian is retrained in the correct procedures.

Step Two

If procedures are being followed correctly, a review of the process is required. This will include a look at the appropriateness of the cleaning tasks and tools, cleaning frequency and any changes in room usage. For example, if the usage of a room has changed from a private office to a staff break room, adjustments in the cleaning tasks and frequencies may be required.

Step Three

New cleaning schedules will be generated that reflect the new cleaning routines. (See example of a Cleaning Schedule: Exhibit 2). The custodian will be retrained in the new procedures. The area will be inspected twice a month for six months to assure quality levels are maintained.

Customer Feedback

Yale University staff and employees can request services using the on-line Facilities Work Request System (FWR). This system feeds into our Financial Accounts Management Information System (FAMIS). The FAMIS system is the work horse system for all Facilities operations at the University. Customers are selected randomly to comment on the quality of the services they receive. Survey results are tabulated every three months, and are forwarded to the manager responsible for the area. In addition to the FWR system and the FAMIS survey, customers may call the Customer Service Center 24 hours a day to request, track or provide feedback on services. All issues are forwarded to the Facilities Superintendent responsible for the building. Facilities Superintendents must establish routine meetings with their building Business Managers or other customer representative at least monthly. Facilities Superintendents report to Area Managers who meet annually with the building Business Manager or customer representative. A record of these meetings is maintained.

Powered Equipment

We are committed to maintaining the use of low-impact powered cleaning equipment and when possible plan to upgrade equipment that reduces building contaminants and minimizes environmental impacts. For example, equipment that requires less water and chemicals will be used whenever we purchase new or replacement equipment. A log for all powered cleaning equipment has been developed. The log documents the date of purchase, manufacturer, serial number, and warranty information as well as all repair and maintenance activities. Facilities Superintendents must maintain these logs (See Equipment Log: Exhibit 3).

Pest Control

A plan that addresses the management of pest populations inside buildings is maintained. The plan includes extermination methods, inspections, and specifications of the circumstances under which pesticides are to be applied. There is a communication plan providing universal notification of pesticide applications. A pesticide application log as well as a record monitoring pest locations is maintained. This record also includes the actions taken to prevent or mitigate future infestations. Area Managers maintain Pest Control Plans.

Yale University utilizes contractors to perform pesticide applications and associated steps to manage and prevent these issues. Contracted Pest Management companies are responsible to display proper signage in the area(s) of pesticide application(s). Where these applications may impact people, Facilities Superintendents are responsible for the notification of pesticide applications (See Universal Notification of Pesticide Application Letter: Exhibit 4) as well as ensuring the pesticide application log is kept up to date.

Safe Handling and Storage

Custodians are required to put on the required personal protective equipment (PPE) whenever using cleaning chemicals. Custodians are trained in the safe handling of chemicals, including a review of the Material Safety Data Sheets (MSDS) for each chemical. The training includes instructions to not mix different chemicals and first-aid actions to take in event of accidental chemical contact with skin or eyes.

Custodians are instructed to report accidents and spills immediately. All accidents are documented and investigated. Custodians are also required to inform their supervisor of any adverse reactions to using chemicals.

Chemicals are stored in dedicated storage rooms and custodial closets away from heat, sunlight and foodstuffs. All containers and spray bottles are clearly labeled. The transfer or storage of cleaning chemicals in unmarked containers, food containers or drink containers is prohibited.

Spill kits are available in each storeroom that contains chemicals for the handling of small spills. For larger spills, the risk of accidental falls is the primary safety hazard. Larger spills are to be contained and controlled using standard diking bags provided for stripping and waxing floors. The spilled chemical is then removed using a shop vacuum. Once the chemical has been removed the area will be washed and rinsed until the entire residue is eliminated.

Standard Operating Procedures

General Cleaning

General Cleaning of all surfaces are performed a minimum of once a week. Restrooms and other public areas are cleaned daily.

1. Microfiber, lint-free dusting cloths are preferred instead of cotton cloths.
2. Always use a folded cloth. Spray cloth with Activeion cleaner. Be sure to refold when full of soil. Refolding provides more cleaning surface area and maximizes effective use of the cloth.
3. Use designated color cloths for different spaces, for example, for restrooms.
4. Soiled cloths are to be placed in a container to be laundered.

Dust Mopping

The dust mopping of floors and stairwells is performed a minimum of once a week.

1. A micro-fiber flat mop is preferred over a dry or chemically treated cotton mop.

Vacuuming

Vacuuming of floors is performed a minimum of once a week.

1. CRI's Green Label Program and HEPA filters are required for vacuums.
2. Vacuum bags should be checked periodically and changed out when they become half-full.

Entryway Maintenance

Entryway Maintenance is performed a minimum of once a week.

1. Sweep or vacuum entry and matting (daily).
2. Roll up and remove matting.
3. Place wet floor signs and possibly caution tape as the situation dictates.
4. Damp mop entryway. This reduces the potential for moisture to lead to bacterial and fungal growth when floor mats get wet.
5. Replace mats and remove wet floor signs when area is dry.

Floor Care

All floors are swept, dust mopped, wet mopped or auto-scrubbed a minimum of once weekly.

Resilient Tile Floors

When wear paths begin to develop in the finish on resilient tile floors, the floor is “top scrubbed” removing a layer of finish, dirt and debris. The floor is then recoated using an uncertified (zinc based) floor finish. All resilient tile floors are maintained with five coats of floor finish. Top scrubbing is a green preferred procedure that avoids the use of toxic strippers.

When floors cannot be restored using the top scrubbing method, a complete stripping of all wax finish is performed using a non-certified (ammonia) based finish remover. A minimum of five coats of finish is then applied according to manufacturer specifications and application timelines.

Natural Stone Floors and Red Quarry Tile Floors

Natural stone floors and red quarry tile floors are swept, vacuumed or dust mopped daily. Natural stone floors and red quarry tile floors are mopped or auto scrubbed a minimum of once a week. No finish is applied to natural stone floors or red quarry tile floors.

Carpet Care

Carpets are deep cleaned once a year using sustainable powered carpet cleaning equipment certified by the Carpet & Rug Institute (CRI). Our machines use less water, fewer chemicals and have advanced ergonomic features compared to non-certified equipment. Interim carpet cleaning is scheduled to address the needs of high traffic areas. Carpets are pre-sprayed before cleaning. Activeion is an effective pre-spray for most stains. A communication program to educate customers on the handling of small spills, and who to call so that spills can be removed is maintained by Facilities Superintendents.

Standards

Our cleaning chemicals meet one or more of the following standards listed below (See End Notes for further clarification of Green Seal Standards). Selected chemicals use dilution systems to minimize waste.

General-purpose cleaners, bathroom, glass and carpet cleaners comply with the Green Seal GS-37 standard.

Floor care products comply with the Green Seal GS-40 standard.

Paper products and liners comply with the Green Seal GS-01 (toilet tissue paper) standard and GS -09 (paper towels & napkins) standard.

Various disinfectants, metal polishers and degreasers comply with the Green Seal GS-40 standard and the Canadian Environmental Choice CCD-112, 113, 115, 147 standards.

Hand soaps comply with the Green Seal GS-41 standard.

Cleaning Equipment Standards

Powered cleaning equipment that helps to reduce building contaminants and minimize any negative impact to the built and natural environment is used. Propane-powered equipment shall not be used.

Vacuum cleaners have high filtration systems and/or HEPA systems. These systems have a positive impact on indoor air quality. Yale is phasing in the use of vacuums that meet the Carpet and Rug Institute's (CRI) Green Label Seal of Approval. All powered equipment will operate with a sound level below 70dBA. The phase-in will be completed in five years (See CRI: Appendix B).

Carpet extraction equipment, used for restorative deep cleaning is certified by the Carpet and Rug Institute's (CRI) Seal of Approval Testing Program for deep-cleaning extractors.

Powered floor maintenance equipment, including electric and battery powered floor buffers and burnishers, equipped with vacuums, guards and/or other devices for capturing fine particulates and operate with a sound level of less than 70dBA is used.

Automated scrubbing machines are equipped with variable-speed feed pumps and on-board chemical metering devices to optimize the use of cleaning fluids. Yale will continue to phase-in scrubbing machines that use only tap water with no need to add additional cleaning products. This phase-in will be completed in five years.

The battery-powered equipment is equipped with environmentally preferable gel batteries.

The powered equipment is ergonomically designed to minimize vibration, noise, and user fatigue.

The equipment is designed with safeguards, such as rollers or rubber bumpers, to reduce potential damage to building surfaces.

Entryway Systems

Grills, grates and matting are used to reduce the amount of dirt, dust, pollen and other particles entering the building at all public entryways. In addition, matting must be in place immediately inside all public entryways. All buildings that are pursuing LEED certification will provide matting at least ten feet long in the direction of travel at primary entries. For all other buildings, matting should be at least six feet long and ten feet long if possible. In locations where this minimum length is not practical, such as those in stairwells, matting will be as long as the space will physically allow or will be met with two sections of matting in order to meet the matting length requirements for LEED compliance. Entryways that are not in regular use or those that serve as emergency exits are excluded. Entry matting will be cleaned as needed, however, they will be cleaned weekly at a minimum. Entry matting will have met the testing and product requirements of the Carpet & Rug Institutes (CRI). Entry Matting will have a solid backing to capture water and will be fire retardant and contain electrostatic property levels less than 2.5 KV. Matting will be constructed of low-emitting materials. When possible, matting will contain recycled materials.

Cleaning Products

Purpose	Standard	Current Product
Multi-Purpose Cleaners	Yale is using a hydrogen peroxide based, Green Seal certified multi-purpose cleaners or electrostatic water.	Alpha HP Diversey GS-37 Ionator EXP Activeion
Hand Cleaners		Aero Blue Deb GS-41
Glass Cleaners	Yale is using Green Seal certified non-ammoniated cleaner or electrostatic water for glass as well as stainless steel and chrome fixtures.	Glance NA Diversey GS-37 Ionator EXP Activeion
Heavy Duty Cleaners/Degreasers	Yale is using a Green Seal certified or Environmental Choice heavy-duty cleaner/degreasers for routine buildups of soap and scale in restrooms and showers.	Crew Diversey 444
Disinfectants	Non-green disinfectants and disinfectant cleaners are used on a non-routine basis.	Crew 42 Diversey Virex Diversey

Paper Products

Our largest non-labor expense is in paper products. Yale commits to using Green Seal certified or EPA preferred towels and tissue that are 100% recycled. The use of post consumer paper waste and recovered paper materials can reduce the impact of these materials in land fills and cut down on the use of virgin materials and save trees.

Purpose	Standard	Current Product
Toilet Tissue	Yale is using Green Seal certified or EPA preferred tissues that are 100% recycled.	Ecosoft Bay West GS-01
Paper Towels	Yale is using Green Seal certified or EPA preferred towels that are 100% recycled.	Ecosoft Towels Bay West GS-09
Multi-fold Towels	Yale has avoided the use of multifold towels, but if required by the location, a Green Seal certified product has been chosen.	Kraft Multifold Bay West GS-09

Liners

Yale is currently using 33% post-consumer recyclable content liners with sizes to fit regulation size containers. The University is currently testing 66% post-consumer recyclable content liners. Yale continues to investigate opportunities for reducing the size and number of liners being used.

Floor Care Systems

Zinc-free finishes have been tested and it has been determined that the products currently on the market are not sufficiently durable in high traffic areas, especially during the winter months. We will continue to search for a better alternative, until that time here are our systems and products:

Purpose	Standard	Current Product(s)
Resilient Tile	Uncertified floor finishes are used on a non-routine basis.	Vectra Diversey - Finish Stride Diversey GS 37 - Cleaner Freedom GS-40 Stripper
Stone Floors	Uncertified specialty stone care products are used on a non-routine basis	Stride Diversey GS 37 – Cleaner Hurricane NCL - Cleaner Patina NCL - Cleaner Cyclone NCL - Cleaner
Wood Floors	Uncertified specialty wood floor products are used on a non-routine basis	Stride Diversey GS 37 - Cleaner Patina NCL - Cleaner Wood Glow Clea-PERMA - Cleaner Wood Glow Gloss- PERMA – Glass Restorer

Microfiber Cloths and Wipes

Microfiber technology has been evaluated for use in dust mops, wet mops and wiping cloths. Until it becomes more cost effective and processes and procedures are in place to launder the soiled microfiber cloths, we will continue to use rental cloths as well as disposable cotton cloths (See Innovations: Page 15 for more information).

Innovations

The pursuit of more effective and/or efficient equipment, methods, and initiatives are the responsibility of every manager within Facilities Services. The Green Cleaning Committee evaluates the efficacy of an innovation and determines if a pilot test is to be conducted. The committee makes its recommendations to the Director of Facilities Services. The Director of Facilities Services makes the decision on the incorporation of any new tool or innovative process into the Green Cleaning Standard. The following are examples currently in use.

Electrostatic Water

In 2006, the Yale University Green Cleaning Committee began testing systems that used electrolyzed water technology for cleaning purposes. The committee was quick to recognize the advantages of electrolyzed water. The water contained cleaning and sanitizing properties without the negative environmental impact of detergents and disinfectants. The first machines tested were half the size of a small car. Our major operational issue was the portability of the product. Custodians would have to go to the unit daily to refill their bottles. The loss in productivity was unacceptable. The effectiveness of the water began to wane after a few hours. With these problems unsolved, we shelved this initiative.

In 2008, we learned that Activeion had developed the technology enabling the production of electrolyzed water in a 32 ounce rechargeable spray bottle. When sprayed directly on to a surface, electrostatic water helps to break apart and lift dirt from surfaces. The machine is also a sanitizer. The electric current created by a battery cell delivers a low level electrical charge to the water. The charge creates a low level electrical field that kills 99.9% of harmful germs. Activeion does not leave behind any residue. It leaves only water that quickly evaporates. Activeion replaces general purpose cleaners and sanitizers. We are currently deploying campus-wide the Activeion EXP, the second generation Activeion model (See Appendix G for more details).

ATP Testing

ATP bioluminescence is a rapid, simple, and reliable way to monitor surface contamination. We use the SystemSURE Plus ATP luminometer hygiene monitoring system. With this device we can quickly determine the effectiveness of our cleaning procedures. With a pen like testing device it measures adenosine triphosphate (ATP), the universal energy molecule found in all animal, plant, bacterial, yeast and mold cells. After cleaning, all sources of ATP should be significantly reduced. A low reading on the ATP luminometer means low levels of contamination. This tool provides an evidence based method for testing the effectiveness of cleaning systems. ATP testing is used by the Green Cleaning Committee to test the effectiveness of various cleaning procedures. This tool is also used in the training of custodians to confirm the effectiveness of a cleaning procedure and obtain their acceptance of the procedure (See Appendix F for more details).

The following is an example of a technology that was explored at Yale but has not worked out.

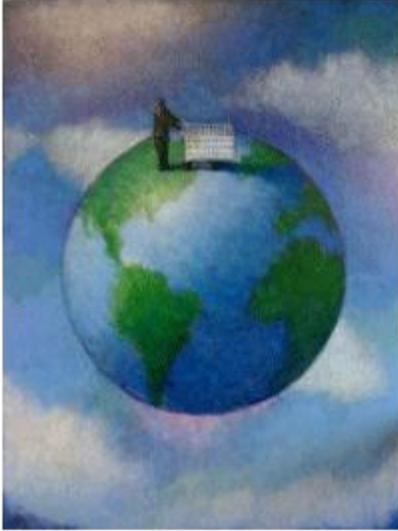
Portable Washing Machines

Portable washing machines were tested for the laundering of micro-fiber cloths. These machines are small enough to fit in the average janitor's closet and were selected as an alternative to contract laundering of micro-fiber cloths. The University evaluated six of these washing machines and we determined this option was not viable for our operation. This is still a worthwhile example to portray that no new innovation can be incorporated without some form of evaluation or review.

Zinc-Free Finishes

We also continue to test zinc-free finishes that are new to the market. To date, we have not found one that is durable enough to meet our needs.

About Green Seal



We develop life cycle-based sustainability standards for products, services and companies and offer third-party certification for those that meet the criteria in the standard. Green Seal has been actively identifying and promoting sustainability in the marketplace and helping organizations to be greener in a real and effective way since 1989.

Our Mission

Green Seal is a non-profit organization that uses science-based programs to empower consumers, purchasers and companies to create a more sustainable world.

Our Vision

A Green Economy. One that is as sustainable as possible--renewable, with minimal impact--so that our environment, all forms of life and our natural resources are protected and our social needs and values are honored.

Our History

Green Seal is a pioneer in promoting a sustainable economy. In 1989 there were no other environmental certification programs in the US and our founders had the foresight to recognize the need for a tool to help shoppers find truly green products. They developed the Green Seal as a non-profit to stand for absolute integrity. Over the years the reputation of the Seal brand has grown to symbolize environmental leadership, and it continues to represent unquestionably green products and services.¹



About CRI

Based in Dalton, Georgia, the Carpet and Rug Institute (CRI) is a nonprofit trade association representing the manufacturers of more than 95 percent of all carpet made in the United States, as well as their suppliers and service providers. We coordinate with other segments of the industry, such as distributors, retailers and installers, to help increase consumers' satisfaction with carpet and to show them how carpet creates a better environment.

Easy access to research data...

CRI is a source of extensive carpet information for consumers, writers, interior designers, facility managers, architects, builders, building owners and managers, installation contractors and retailers. Since there is so much information about carpet available, CRI wants you to have the right information. That's why CRI continually conducts primary research and gathers data from other sources to help you make the right decisions based on the facts.²

Materials, free of charge and some for a small charge, on all of the following topics are available:

- Aesthetic, functional and financial benefits of carpet
- Professional assistance for the carpet or rug selection process
- Installation guidelines
- Characteristics of fibers
- Carpet construction
- Carpet's role in indoor air quality and the environment
- In-depth technical guidance

In 1992, CRI launched its Green Label program to test carpet, cushions, and adhesives to help identify products with very low emissions of VOC's.

Appendix C

About LEED

LEED, or Leadership in Energy and Environmental Design, is an internationally-recognized green building certification system. Developed by the U.S. Green Building Council (USGBC) in March 2000, LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

LEED promotes sustainable building and development practices through a suite of rating systems that recognize projects that implement strategies for better environmental and health performance. The LEED rating systems are developed through an open, consensus-based process led by LEED committees, diverse groups of volunteers representing a cross-section of the building and construction industry. 3

Appendix D



About USGBC

The Washington, D.C.-based U.S. Green Building Council (USGBC) is a 501c3 non-profit organization committed to a prosperous and sustainable future for our nation through cost-efficient and energy-saving green buildings.

With a community comprising 79 local affiliates, more than 16,000 member companies and organizations, and more than 160,000 LEED Professional Credential holders, USGBC is the driving force of an industry that is projected to contribute \$554 billion to the U.S. gross domestic product from 2009-2013. USGBC leads an unlikely diverse constituency of builders and environmentalists, corporations and nonprofit organizations, elected officials and concerned citizens, and teachers and students.

Buildings in the United States are responsible for 39% of CO₂ emissions, 40% of energy consumption, 13% water consumption and 15% of GDP per year, making green building a source of significant economic and environmental opportunity. Greater building efficiency can meet 85% of future U.S. demand for energy, and a national commitment to green building has the potential to generate 2.5 million American jobs. ⁴

Appendix E



The **Environmental Choice Program** is an ecolabelling scheme that was established by Environment Canada in 1988 with over 300 categories of products to help consumers identify services/products which are less harmful to the environment.

The "Environmental Choice" Eco-Logo symbol of certification is a green colored maple leaf intertwined within three doves.

There were more than 3000 approved products as of May 2007, with 119 licensees and 29 guidelines under which companies may be licensed and their products certified.

EcoLogo provides customers – public, corporate and consumer – with assurance that the products and services bearing the logo meet stringent environmental standards that have been verified by a third party auditor. By certifying environmental leaders in over 120 product categories, EcoLogo helps customers find and trust the world's most sustainable products.

The EcoLogo Program is a Type I eco-label, as defined by the International Organization for Standardization (ISO). This means that the Program compares products/services with others in the same category, develops rigorous and scientifically relevant criteria that reflect the entire lifecycle of the product, and awards the EcoLogo to those that are verified by an independent third party as complying with the criteria.⁵

ATP

SystemSURE Plus™
ATP Hygiene Monitoring System



SystemSURE Plus is the next generation of the world's best-selling SystemSURE II ATP hygiene monitoring system. This new system uses state-of-the-art electronics with improved functionality, but still maintains its small hand-held design and affordability.

How does the SystemSURE Plus work?

In conjunction with the Ultrasnap and Aquasnap testing devices, SystemSURE Plus measures adenosine triphosphate (ATP), the universal energy molecule found in all animal, plant, bacteria, yeast and mold cells. Residues, particularly food or organic residue, contain large amounts of ATP. When left on a surface, residues can harbor and grow bacteria, cause cross-contamination, develop biofilm and many other problems that can compromise product quality. Microbial contamination contains ATP, but in small amounts. After cleaning, all sources of ATP should be significantly reduced. When ATP is brought into contact with Hygiena's unique, liquid-stable luciferase/luciferin reagent in the Ultrasnap or Aquasnap testing device, light is emitted in direct proportion to the amount of ATP present. The system measures the amount of light generated and provides information on the level of contamination in just seconds.⁶

Activeion



The upside to this technological breakthrough is immense.

Millions of bottles of waste will be eliminated through Activeion technology and sustainable tap water.

No longer do families, schools and hospitals need to jeopardize health for immediate cleanliness.

The environment will thrive without toxic chemicals.

The future is here. Experience the phenomenon that will revolutionize cleaning forever.

See how it works: <http://www.activeion.com/FutureOfClean.aspx>.7

Exhibit 1

Custodial Staffing Example

**Facilities
Central North
Athletics A**

Hours Pos#	Schedule	Last, First, Title
40.00 ATH-A-CTL	7:00 AM - 3:30 PM M T W T F	Simone, Pasquale CTL
40.00 ATH-A-Cullman-1	7:00 AM - 3:30 PM S W T F S	Triplett, Wilhelmina SC
40.00 ATH-A-FIELD-01	7:00 AM - 3:30 PM M T W T F	VACANT
40.00 ATH-A-KEN\BW-01	4:00 AM - 12:00 PM	Aponte, Sonia Custodian
40.00 ATH-A-KEN\BW-01	7:00 AM - 3:30 PM	Aponte, Sonia Custodian
40.00 ATH-A-KEN\BW-01	4:00 AM - 12:00 PM	Aponte, Sonia Custodian
40.00 ATH-A-Smilow-1	7:00 AM - 3:30 PM M T W T F	Pepe, Patricia A Custodian
40.00 ATH-A-Smilow-2	7:00 AM - 3:30 PM M T W T F	Evans, Cerise Custodian
40.00 ATH-A-Smilow-3	7:00 AM - 3:30 PM M T W T F	Tart, Ruthena Custodian
40.00 ATH-A-Smilow-4	7:00 AM - 3:30 PM S M T F S	Dorsey, Christopher Custodian
400.00 Hours		10 Positions

Exhibit 2

Custodial Cleaning Schedule Example

Routine Work Order by Job/Employee
YHP-05-L34 Unassigned, Yale

Yale University
Yale University

Facility: UNIV HEALTH SRV CTR-NEW

Section: 2ND FLOOR
Area: 2122 TOILET

Area Sq Ft: 48
Area Color: White

<u>Priority</u>	<u>Sequence:</u>	<u>Task:</u>	<u>YUHS-Restroom Public (5) 4-times-</u>	<u>Min Once</u>	<u>Sun</u>	<u>Mon</u>	<u>Tue</u>	<u>Wed</u>	<u>Thu</u>	<u>Fri</u>	<u>Sat</u>
X	3	Trash - empty (2nd time)		0.08		X	X	X	X	X	
X	4	Restroom - fully clean (by sq.ft.) (2nd time)		2.22		X	X	X	X	X	
X	5	Trash - empty (3rd time)		0.08		X	X	X	X	X	
X	6	Restroom - fully clean (by sq.ft.) (3rd time)		2.22		X	X	X	X	X	
X	7	Trash - empty (4th time)		0.08		X	X	X	X	X	
X	8	Restroom - fully clean (by sq.ft.) (4th time)		2.22		X	X	X	X	X	
Area Hours: 2122 TOILET				0.12							

Section: 2ND FLOOR
Area: 2140 PUBLIC WAITING/HEALTH

Area Sq Ft: 366
Area Color: White

<u>Priority</u>	<u>Sequence:</u>	<u>Task:</u>	<u>Lounge - Carpet (5) w/2nd clean</u>	<u>Min Once</u>	<u>Sun</u>	<u>Mon</u>	<u>Tue</u>	<u>Wed</u>	<u>Thu</u>	<u>Fri</u>	<u>Sat</u>
X	6	Trash - empty and remove - (2nd time)		1.15		X	X	X	X	X	
X	7	Spot Clean Heavy - (2nd time)		0.77		X	X	X	X	X	
Area Hours: 2140 PUBLIC WAITING/HEALTH				0.03							

Section: 2ND FLOOR
Area: 2149 TOILET

Area Sq Ft: 62
Area Color: White

<u>Priority</u>	<u>Sequence:</u>	<u>Task:</u>	<u>YUHS-Restroom Public (5) 4-times-</u>	<u>Min Once</u>	<u>Sun</u>	<u>Mon</u>	<u>Tue</u>	<u>Wed</u>	<u>Thu</u>	<u>Fri</u>	<u>Sat</u>
X	3	Trash - empty (2nd time)		0.11		X	X	X	X	X	
X	4	Restroom - fully clean (by sq.ft.) (2nd time)		2.86		X	X	X	X	X	
X	5	Trash - empty (3rd time)		0.11		X	X	X	X	X	
X	6	Restroom - fully clean (by sq.ft.) (3rd time)		2.86		X	X	X	X	X	
X	7	Trash - empty (4th time)		0.11		X	X	X	X	X	
X	8	Restroom - fully clean (by sq.ft.) (4th time)		2.86		X	X	X	X	X	
Area Hours: 2149 TOILET				0.15							

Section: 2ND FLOOR
Area: 2162 MENS TOILET

Area Sq Ft: 51
Area Color: White

<u>Priority</u>	<u>Sequence:</u>	<u>Task:</u>	<u>YUHS-Restroom Public (5) 4-times-</u>	<u>Min Once</u>	<u>Sun</u>	<u>Mon</u>	<u>Tue</u>	<u>Wed</u>	<u>Thu</u>	<u>Fri</u>	<u>Sat</u>
X	3	Trash - empty (2nd time)		0.09		X	X	X	X	X	
X	4	Restroom - fully clean (by sq.ft.) (2nd time)		2.36		X	X	X	X	X	
X	5	Trash - empty (3rd time)		0.09		X	X	X	X	X	
X	6	Restroom - fully clean (by sq.ft.) (3rd time)		2.36		X	X	X	X	X	
X	7	Trash - empty (4th time)		0.09		X	X	X	X	X	
X	8	Restroom - fully clean (by sq.ft.) (4th time)		2.36		X	X	X	X	X	
Area Hours: 2162 MENS TOILET				0.12							

Exhibit 3

Equipment Log Example

Equipment by Supervisor List

Supervisor:

Employee:

Customer:

Facility:

Section:

Area:

Category Name: SN# Manufacturer Purchase Date Purchase Price Warranty Exp. Date.

Universal Notification of Pesticide Use Example

Dear Parent, Guardian, or Staff Member

Re: Notice of Pesticide Application

The University uses a holistic approach to controlling insects, rodents, and other pests. This holistic approach is often called Integrated Pest Management (IPM). Through maintenance and cleaning, we will reduce or eliminate available food and water sources and hiding places for the pests. We will also routinely monitor the school area to detect pest problems and prevent the pests from becoming established. Some techniques we use include pest monitoring, sanitation, pest exclusion, proper food storage, pest removal and--as a last resort--pesticides.

Sometimes pesticide use may be necessary to control a pest problem. When that happens, the University uses the lowest risk products available. We also notify building occupants of our use of pesticides.

Date of Application:

Area of Application:

Pesticide Applied:

If you have any questions, concerning this application please contact_____.

For further information about pesticides and your right to know, call the Yale University Environmental Health & Safety Department at 203-785-3550.

Yale University Green Cleaning Training



Yale University started its Green Cleaning training program in earnest in 2004. Here are some of the topics covered in our green cleaning training:

- Defining clean
- Soaps, detergents, sanitizers and their harmful attributes
- The role of Green Seal
- A review of our green products and their sustainable advantages
- A review of our green paper products and their sustainable advantages
- A review of our green equipment and their sustainable advantages
- A review of our dispensing systems and their sustainable advantages
- Hand hygiene training

Inspection Form Example

Inspection Report **185**
Report Created: **7/13/2011**

Inspector
Inspection Date:

Customer: Yale Central Campus
Facility: PAYNE WHITNEY GYM (PWG)
Section: BASEMENT

TB09 WOMENS TOILET

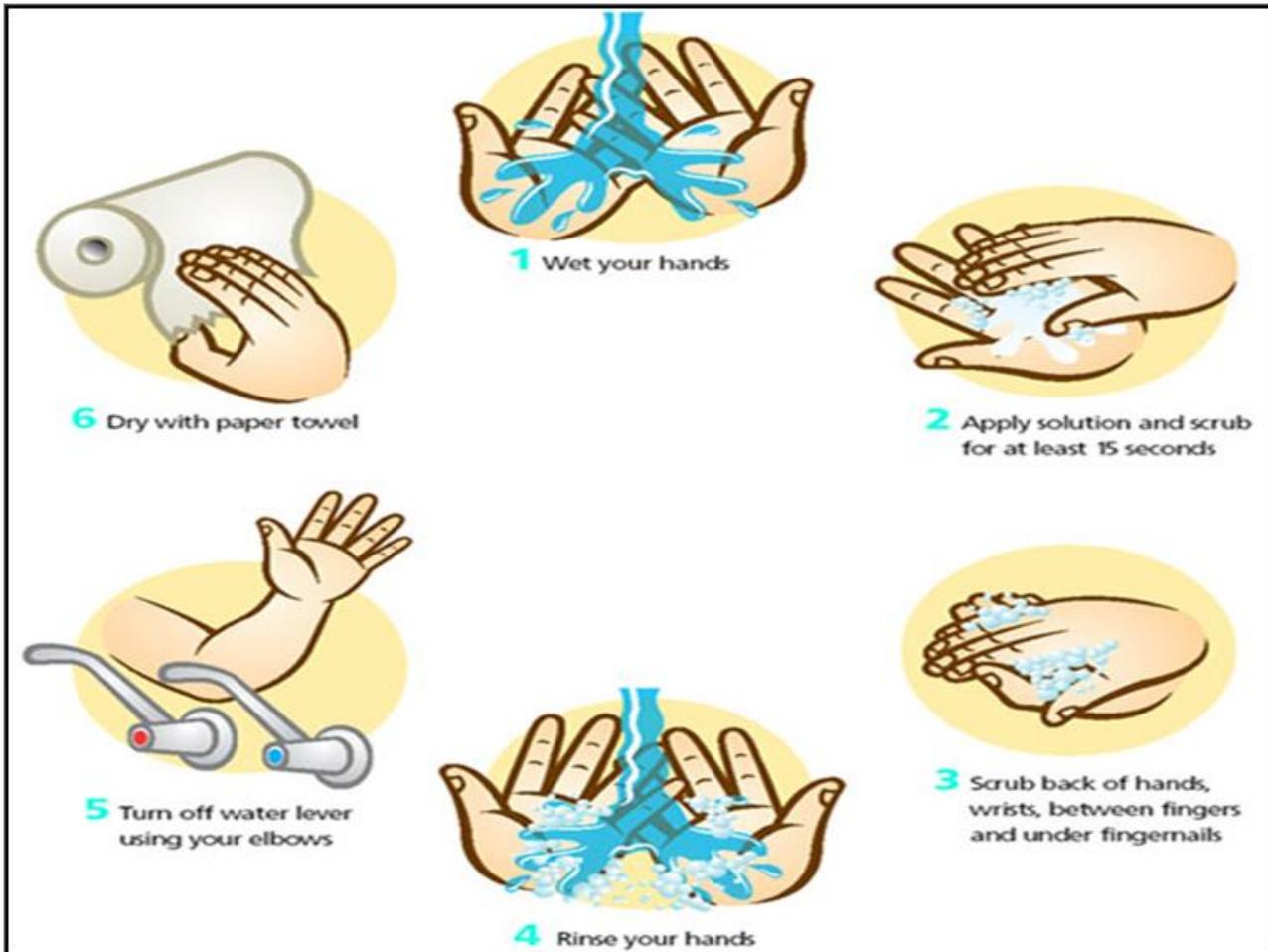
Area **Area Not** **Area Not**
Acceptable **Acceptable** **Inspected**

Employee: Williams, Sonya

		Item	Item Not	Item Not
		Acceptable	Acceptable	Inspected
	<u>Inspect Item - Seq:</u>			
	Trash	1		
floor cleanliness	2			
sink	3			
toilets	4			
mirrors	5			
seats clean	6			
walls	7			
spot cleaning	8			
doors	9			
windows	10			
radiator	11			
vents	12			
door frame	13			
refill soap dispensers	14			
dispensers refilled	15			
windowsill	16			
partitions	17			
baseboard	18			
sink traps	19			
showers	20			
bath tub	21			

HAND WASHING INSTRUCTIONS

Exhibit 7



APPA CLEANING STANDARDS

The Association of Physical Plant Administrators (APPA) cleaning standards from APPA's Custodial Staffing Guidelines for Educational Facilities.

Level 1 – Orderly Spotlessness

This level establishes cleaning at the highest level. It was Spotlessness developed for the corporate suite, the donated building or the historical focal point. This is show-quality cleaning for that prime facility.

Level 2 – Ordinary Tidiness

This level is the base upon which this study is established. Tidiness is the level at which cleaning should be maintained. Lower levels for washrooms, changing/locker rooms and similar type facilities are not acceptable.

Level 3 – Casual Inattentiveness

This level reflects the first budget cut, or some other staffing- related Inattention problem. It is a lowering of normal expectations. While not totally acceptable, it has yet to reach an unacceptable level of cleanliness.

Level 4 – Moderate Dinginess

This level reflects the second budget cut, or some other significant Dinginess staffing-related problem. Areas are becoming unacceptable. People begin to accept an environment lacking normal cleanliness. In fact, the facility begins to constantly look like it requires a good "spring cleaning."

Level 5 – Unkempt Neglect

This is the final and lowest level. The trucking industry would call this "just-in-time cleaning." The facility is always dirty, with cleaning accomplished at an unacceptable level.

End Notes

Credits and additional information on these standards:

1. Green Seal, July 8, 2011 <http://www.greenseal.org/AboutGreenSeal.aspx>
2. Carpet & Rug Institute, July 8, 2011 <http://www.carpet-rug.org/>
3. LEED, July 10, 2011 <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988>
4. U.S. Green Building Council (USGBC), 7/10/2011 <http://www.usgbc.org/>
5. Environmental Choice, 7/8/2011 <http://environmentalchoice.com/en/>
6. Hygiena 7/12/2011 http://www.hygiena.net/systemsure_plus.html
7. Activeion EXP 9/11/2011 <http://www.activeion.com/FutureOfClean.aspx>