

Yale University Green Cleaning Standards

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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.

The 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). Other sources for our standards are Green Seal (GS) and the Carpet and Rug Institute (CRI) (See Appendix A&E 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.

Yale's cleaning standards are 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.

Leadership

Yale University's Green Cleaning Standards is a written document establishing how green cleaning standards are to be used, managed, and evaluated. The administration and leadership requirements identified here are for LEED certified buildings or buildings pursuing LEED certification, as well as pertinent to all Yale University buildings. The University has mandated that all comprehensive new construction and renovation project designs must meet LEED "Gold" status (60-79 points) or Platinum (80+ points). LEED requirements are based on earning point across several categories, which include energy use and air quality.

Administrative & Management Requirements

Training

A training program has been written for Facilities Superintendents, cleaning and maintenance staff, who are responsible for implementing green cleaning procedures daily. 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. The training is conducted annually. All custodians and managers will be trained. Area Managers are responsible for training program delivery and compliance.

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 using 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.

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. Facilities Superintendents and their Custodial Team Leaders (CTL) will conduct routine inspections and maintain records of inspection results and the corrective actions taken. 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 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. 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.

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 by superintendent, custodial team leader, and/or senior custodian. The log documents the date of purchase, manufacturer, model number, serial number, and as well as all repair and maintenance activities.

Standard Operating Procedures

General Cleaning

General cleaning of all surfaces is performed per servicing schedule.

- Microfiber, lint-free cloths are preferred instead of cotton cloths.

Dust Mopping and floor Care

The dust mopping of floors and stairwells is performed per servicing schedule. All floors are swept, dust mopped, wet mopped, or auto-scrubbed per servicing schedule.

- Microfiber flat mop is preferred.

Vacuuming

Vacuuming of floors is performed per servicing schedule.

- Vacuums with HEPA filters are required for vacuums.

Entryway Maintenance

Entryway maintenance is performed per servicing schedule.

Resilient Tile Floors

Facilities Services will continue to test and evaluate more sustainable Green Certified finishes. This will be implemented where practical.

Natural Stone Floors and Red Quarry Tile Floors

Natural stone floors and red quarry tile floors are swept, vacuumed or dust mopped, wet mopped or auto scrubbed per servicing schedule. No finish is applied to natural stone floors or red quarry tile floors.

Carpet Care

Carpets are deep cleaned per servicing schedule 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. Orbio and/or an approved carpet cleaner 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. Sustainable flooring which needs less maintenance such as Cork, Nora and Chilewich are types of flooring being utilized on campus and replacing traditional high maintenance VCT, carpet and other flooring.

Green Cleaning Standards

Cleaning chemicals should 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.

Examples include: 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.

Orbio Multi-Surface cleaner meets Green Seal Standard GS-37, and received Platinum Level Seal of Approval from the Carpet and Rug Institute.

Yale Health Center (YHC) uses different chemicals that have been approved through a separate approval process.

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 using vacuums that meet the Carpet and Rug Institute's (CRI) Green Label Seal of Approval (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 are equipped with vacuums, guards and/or other devices for capturing fine particulates.

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. Matting should be a minimum length of ten feet. In locations where this minimum length is not practical, such as those in stairwells, matting will be present if the space physically allows. Entryways that are not in regular use or those that serve as emergency exits are excluded. Entry matting will be cleaned per servicing schedules, which is no less than weekly. Entry matting will have a solid backing to capture water. 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 Neutral PH cleaner, Green Seal certified multi-purpose cleaners or electrolyzed water.	Orbio Multi-Surface Cleaner Stride Diversey Alpha HP-Diversey
Hand Cleaners		Aero Blue Deb GS-41
Glass Cleaners	Yale is using Green Seal certified non-ammoniated cleaners or electrolyzed water for glass as well as stainless steel and chrome fixtures.	Glance NA Diversey GS-37 Orbio Multi-Surface Cleaner
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 44 Diversey
Disinfectants	Non-green disinfectants and disinfectant cleaners are used on a routine basis for restrooms, locker rooms, showers within athletic facilities and dormitories. The Orbio MultiMicro 200 disinfectant is used on a regular basis within the university (see list of buildings on page 14).	Crew 42 Diversey Virex Diversey Clorox Fusion Clorox Healthcare (only used during outbreaks of infectious diseases or in YHC) Orbio MultiMicro 200

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 landfills 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

We use different-colored liners for recycling where applicable the current Yale standard is blue for recycling and black or clear for trash. This helps ensure that each type of waste goes into the appropriate container.

EBP Item #	Description	Case Pack	Case Price
PC46HRN	Brute Barrel - 40 x 46 Natural .59 mil / Dry Load 64 lbs.	250	\$29.12
PC24LWN	Desk Side - 24 x 24	1000	\$21.47
PCSJXHBU	Recycle Tallboy 28 x 45 Blue .7 mil / Dry Load 64 lbs.	250	\$24.86
PCSJHRN	Tall Boy 28 x 45 Natural .59 mil / Dry Load 55 lbs.	250	\$19.60
PC58100N	HD Brute 38 x 58 Natural .9 mil / Dry Load 94 lbs.	150	\$27.57
PC46100N	HD Brute Barrel - 40 x 46 Natural .9 mil / Dry Load 86 lbs.	100	\$15.45

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
Resilient Tile	Uncertified floor finishes are used on a non-routine basis	Vectra Diversey - Finish Freedom GS-40 Stripper Stride Diversey GS 37 - Cleaner
Stone Floors	Uncertified specialty stone care products are used on a non-routine basis	Stride Diversey GS 37 – Cleaner Cyclone NCL - Cleaner Patina NCL - Cleaner Hurricane NCL – Cleaner Orbio Multi-Surface Cleaner
Wood Floors	Uncertified specialty wood floor products are used on a non-routine basis	Stride Diversey GS 37 - Cleaner Restorer Wood Floor- Perma-Wood- Glow Patina NCL – Cleaner Orbio Multi-Surface Cleaner

Microfiber Cloths and Wipes

Microfiber technology has been evaluated for use in dust mops, wet mops, and wiping cloths. The Department’s goal is that by June 30, 2018 that 98% of all work units in Facilities Services will have microfiber cloths in full use. These will be color coded (red for restrooms, blue for glass and general cleaning). While there will be little to no cost savings, we will be greatly reducing the amount of waste we produce with cotton cloths that are put into the waste stream.

Orbio Technology

A new breakthrough technology — called On-Site Generation (OSG) — is rapidly gaining the acceptance and confidence of early adopters.

OSG technology converts water, electricity and a small amount of salt into effective cleaning and antimicrobial solutions. It eliminates the need for many packaged chemicals that have been used for years to clean education facilities, hospitals, public venues, casinos, retail stores and

Using a combination of just water, salt, and electricity, Orbio technology is a safe, healthy and green alternative.

The machine uses electrolysis to turn water, salt and electricity into a powerful cleaning agent that disinfects and sanitizes. The final product is then transferred into either handheld spray containers or bigger machines depending on whether it will be used to clean off bathroom and kitchenette counters or floors and carpets.

The environment also benefits from Yale’s switching to alternative cleaning products. Orbio technology does not have VOCs, dyes, or buffers that can emit harmful chemicals into the atmosphere and water. Since 2013, Yale Facilities have more than doubled their purchases of green-certified chemicals.

There is a limitation to Orbio technology. Due to its size, the machine must be placed in a location where larger groups have access to it. Otherwise, it is not economically feasible. For a university campus, however, there are multiple placement opportunities.¹

Yale University Facilities Using ORBIO System

Sterling Memorial Library	Bass Library	Beinecke Rare Book Library
344 Winchester Ave.	Yale Law School	Yale School of Management
Sage Hall	Kroon Hall	KBT
Bass	KCL	SCL
CRB	Sloane	350 Edwards
Watson Center	Founders Hall	T.M. Evans Hall
Steinbach Hall	46 Hillhouse	Franklin and Murray

Appendix A

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.²



Appendix B

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.

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 VOCs.³

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.⁴

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.⁵

End Notes

Credits and additional information on these standards:

1. http://web.tennantco.com/GlobalAssets/WebAssets/Orbio/TANZ_Orbio_LR.pdf
2. <http://www.greenseal.org/AboutGreenSeal.aspx>
3. <http://www.carpet-rug.org/>
4. https://www.usgbc.org/leed?gclid=EAlaIqobChMInfGg-5iW1gIVTrnACh20XwSvEAAYASAAEgKVIPD_BwE
5. <https://www.usgbc.org/education-at-usgbc>