

The University of Connecticut's Green Cleaning Agenda

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What is Green Cleaning?

Green Cleaning is defined as cleaning to protect health without harming the environment. Green cleaning is a widely accepted movement that uses procedures and products to make cleaning for the health of building occupants, janitors, and the environment a primary concern.

Why the need for Green Cleaning?

It has been found that some widely used cleaning products have serious adverse effects on the health of building occupants and janitors. The average person spends about 90% of their day indoors, where air pollution from diverse sources such as cleaners, upholstery, and carpeting can be up to 100 times greater than outdoor air. Short term health problems caused by exposure to hazardous cleaning products range from eye irritation and coughing to chest pain, vomiting, cramps, and diarrhea. Long-term effects may include liver and kidney failure, birth defects, emphysema, brain damage, and even cancer. 11.6% of work-related asthma comes from cleaning products. In addition, people who suffer from multiple chemical sensitivity syndrome, a disease that is not fully understood or recognized by the medical community, feel that low level exposure to chemicals, such as cleaning products, cause them to feel sick.

Not only are humans affected but the affects of these cleaning chemicals are felt down stream, literally. Some ingredients of cleaning products are associated with eutrophication (toxics.usgs.gov/definitions/eutrophication.html) of streams and are toxic to aquatic organisms.

Why at the University of Connecticut?

Daily and periodic janitorial cleaning is commonplace at every UConn campus due to the large mass of traffic from the university community. As a result the University of Connecticut is a large consumer of cleaning products. Therefore, we are working to encourage the use of green cleaners not only to promote clean and safe working conditions but also to reduce the impact on the environment. At the same time the University of Connecticut is now required to meet Governor Rell's Executive Order #14 at the soonest time possible.

Governor Rell's Executive Order No.14

“All state agencies in the executive branch and **all higher education agencies and institutions**, shall, when procuring or contracting for cleaning and/or sanitizing services provide in such contracts or procurement agreements, require contractors of the State or persons or entities providing cleaning and/or sanitizing services to the State use cleaning and/or sanitizing products having properties that minimize potential impacts to human health and the environment, consistent with maintaining clean and sanitary facilities.”

Benefits of Buying Green

Choosing less hazardous products that have positive environmental attributes (e.g., biodegradability, low toxicity, low volatile organic compound (VOC) content, reduced packaging, low life cycle energy use) and taking steps to reduce exposure can minimize harmful impacts to custodial workers and building occupants, improve indoor air quality, and reduce water and ambient air pollution while also ensuring the effectiveness of cleaning in removing biological and other contaminants from the building's interior.

Buying cleaners in concentrates with appropriate handling safeguards, and reusable, reduced, or recyclable packaging, reduces packaging waste and transportation energy.

Buying less hazardous cleaners may reduce costs when it comes time to properly dispose of any leftover cleaners.

Green Product Criteria

Based of the recommended Green Seal certified products

Mandatory Environmental Requirements

- Toxicity
- Carcinogens and Reproductive Toxins
- Skin and Eye Irritation
- Skin Sensitization
- Combustibility
- Smog, Ozone, and Indoor Air Quality
- Aquatic Toxicity
- Eutrophication
- Aquatic Biodegradability
- Concentrates
- Fragrances
- Prohibited Substances

Additional Requirements

- Training
- Packaging
- Labeling

Desirable Criteria

- Additional Training attributes
- Additional Packaging attributes
- Additional Labeling Information
- Dispensing Equipment
- Non-animal Testing
- Asthmagen Data
- Company-wide Environmental Commitment

Toxicity

The *undiluted* product **must** not be toxic to humans. Dispensing system concentrates **must** be tested as used. A product is considered toxic if any of the following criteria apply: Oral lethal dose 50 (LD50) ≤ 2000 mg/kg

Inhalation lethal concentration (LC50) ≤ 20 mg/L

If the vapor phase concentration of the product at room temperature is less than 20 mg/L, it should be tested at its saturation concentration. If it is not toxic at this concentration, it passes the inhalation criteria. Toxicity shall be measured on the product as a whole.

Alternatively, a mixture need not be tested if existing toxicity information demonstrates that each of the ingredients complies. Ingredients that are nonvolatile do not require inhalation toxicity testing, and ingredients that are not readily absorbed through the skin do not require dermal toxicity testing. It is assumed that the toxicity of the individual component compounds are weighted and summed and that there are not synergistic effects. The toxicity testing procedures should meet the requirements put forth by the Organization for Economic Cooperation and Development (OECD) Guidelines for Testing of Chemicals. These protocols include Acute Oral Toxicity Test (TG 401), Acute Inhalation Toxicity Test (TG 403), and Acute Dermal Toxicity Test (TG 402).

Carcinogens and Reproductive Toxins

The undiluted products **must** not contain any ingredients that are carcinogens or that are known to cause reproductive toxicity, as defined by the following agencies:

Carcinogens: International Agency for Research on Cancer (IARC), National Toxicology Program (NTP), US Environmental Protection Agency, or the Occupational Health and Safety Administration (OSHA)

Reproductive Toxicity: Those chemicals listed by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (CA Code of Regulations, Title 22, Division 2, Subdiv. 1, Chapter 3, Sect. 1200, *et seq.*).

Naturally occurring elements and chlorinated organics, which may be present as a result of chlorination of the water supply, are not considered ingredients if the concentrations are below the applicable maximum contaminant levels in the National Primary Drinking Water Standards found in 40 Code of Federal Regulations (CFR) Part 141.

Skin and Eye Irritation

The *undiluted* product **must** not be corrosive to the skin or eyes. Dispensing-system concentrates **must** be tested as used. The undiluted cleaning product **must** not be corrosive to the skin, as tested using the Human Skin Construct systems (Liebsch et al. 2000; Fentem et al. 1998). The undiluted cleaning product **must** also not be corrosive to the eye as tested using the bovine opacity and permeability test (BCOP) (Sina et al. 1995) after a 10-minute exposure. The PMT will also accept the results of other peer-reviewed or standard in vitro or in vivo test methods demonstrating that the product mixture is not corrosive.

Skin Sensitization

The *undiluted* product **must** not be a skin sensitizer as tested by the OECD Guidelines for testing chemicals, Section 406. Dispensing system concentrates **must** be tested as used. The PMT shall also accept the results of other standard test methods, such as those described in Buehler (1994) or Magnusson and Kligman (1969), as proof that the product or its ingredients are not skin sensitizers.

Combustibility

The *undiluted* product **must** not be combustible. The product or 99% of by volume of the product ingredients **must** have a flashpoint above 150 F, as tested using either the Cleveland Open Cup Tester (ASTM D92-97) or a closed cup method International Standards Organization (ISO) 13736 or ISO 2719. Alternatively the product **must** not sustain a flame when tested using ASTM D 4206.

Photochemical Smog, Tropospheric Ozone Production, and Indoor Air Quality

The product *as used* **must** not contain substances that contribute significantly to the production of photochemical smog, tropospheric ozone and poor indoor air quality. The volatile organic compound (VOC) and of the product *as used* shall be determined by the CA Air Resources Board Method 310 and **must** not exceed the following:

- 1% by weight for general purpose and bathroom cleaners
- 3% by weight for glass cleaners

Aquatic Toxicity

The product *as used* **must** not be toxic to aquatic life. A compound is considered not toxic to aquatic life if it meets one or more of the following criteria: Acute LC50 for algae, daphnia, or fish = 100 mg/L

For purposes of demonstrating compliance with this requirement, aquatic toxicity testing is not required if sufficient aquatic toxicity data exist for each of the product's ingredients to demonstrate that the product mixture complies. Aquatic toxicity tests shall follow the appropriate protocols in ISO 7346.2 for fish and in 40 CFR 797, Subpart B for other aquatic organisms.

Eutrophication

The product *as used* **must** not contain more than 0.5% by weight of total phosphorus.

Aquatic Biodegradability

Each of the organic ingredients **must** exhibit ready biodegradability in accordance with the OECD definition except for a FIFRA-registered ingredient in bathroom cleaner.

However, all other ingredients in a FIFRA-registered bathroom cleaner **must** comply.

Biodegradability will be measured by one of the following methods: ISO 9439 carbon dioxide evolution test, ISO 10708 (two-phase close bottle test), ISO 10707 (close bottle test), ISO 7827 (dissolved organic carbon removal). Specifically within a 28-day test, the ingredient shall meet one of the following criteria within 10 days of the time when the biodegradation first reaches 10%: Removal of dissolved organic carbon (DOC) = >70% Biological oxygen demand (BOD) = >60% % of BOD theoretical oxygen demand (ThOD) = >60% % CO₂ evolution of theoretical = >60%

For organic ingredients that do not exhibit ready biodegradability in these tests, the manufacturer may demonstrate biodegradability in sewage treatment plants using the

Coupled Units Test found in OECD 303A by demonstrating dissolved organic carbon (DOC) removal >90%.

Testing is not required for any ingredient for which sufficient information exists concerning its biodegradability, either in peer-reviewed literature or databases or proving that the ingredient was tested in accordance with standard test procedures.

Concentrates

The product **must** be a concentrate, except for FIFRA-registered bathroom cleaners.

Fragrances

Manufacturers **must** identify any fragrances on their MSDS. Any ingredient added to a product as a fragrance **must** follow the Code of Practice of the International Fragrance Association.

Prohibited Ingredients

The product **must** not contain the following ingredients:

- Alkylphenol ethoxylates
- Dibutyl phthalate
- Heavy metals including arsenic, lead, cadmium, cobalt, chromium, mercury, nickel or selenium
- Ozone depleting compounds

Carpet Cleaners

Products **must** meet the Mandatory Health and Environmental Specifications established in Section II.

Products **must** exhibit a VOC limit of not greater than 1%

Disinfectants/Sanitizers

Products **must** meet the Mandatory Health and Environmental Specifications established in Section II EXCEPT for the active ingredients with respect to biodegradability.

Products **must** exhibit a VOC limit of not greater than 1%

Products **must** be registered by the US Environmental Protection Agency

Floor Care Products

1. Floor Finishes

Mandatory - The products **must** be free of zinc and other heavy metals.

Desirable - It is desirable that the products:

not contain phthalates

not contain glycol ethers or ammonia

2. Floor Strippers

Mandatory - The products **must** be free of zinc and other heavy metals.

Desirable - It is desirable that the products (in concentrate form):

have a pH between 2.5 and 12

exhibit a VOC limit of not greater than 1%

not contain glycol ethers or ammonia

Maintenance Products

Mandatory - The products **must** be free of zinc and other heavy metals.

Desirable - It is desirable that the products:

not contain phthalates

exhibit a VOC limit of not greater than 1%

not contain glycol ethers and/or ammonia

Hand Soaps

Mandatory - The products **must not** be anti-microbial (a low level preservative is permissible, however, in order to prevent bacterial growth)

Desirable - It is desirable that products have a pH between 6 and 8.5

Janitorial Paper/Textile Supplies

Paper products **must** meet or exceed the minimum federal standards and Commonwealth of Massachusetts standards for post-consumer recycled content and **must** be unbleached or bleached without the use of chlorine (Processed Chlorine Free). It is desirable that paper products have dispensing options and packaging that reduce the use of natural resources. Textile products (e.g. rags) **must** be made of reclaimed/recycled textiles. Green Seal certified products are preferred.

Additional & Desirable Requirements

Training

Mandatory

The product manufacturer, their distributor, or a third party **must** offer training or training materials in the proper use of the product. These **must** include step-by-step instructions for the proper dilution, use, disposal, and the use of equipment.

Desirable

It is **desirable** that such training and support include, but not be limited to:

- on-site initial training for use of products
- ongoing training either on-site or at designated sites throughout the Commonwealth
- a phone number, preferably toll-free, which departments can call to receive instructions and assistance on product use

Packaging

Mandatory

The primary package **must** be recyclable. Alternatively, manufacturers may provide for returning and refilling their packages.

Desirable

It is **desirable** that a Bidder's primary and/or secondary packaging be made with a percentage of post-consumer recycled material and represents a source reduction measure.

Labeling

Mandatory

The manufacturer's label **must** state clearly and prominently that dilution with water from the cold tap is recommended and shall state the recommended level of dilution. The manufacturer shall also include detailed instructions for proper use and disposal and for the use of personal protective equipment.

Desirable

It is **desirable** that:

- products have color coded labels in lieu of dyes and be made with a percentage of post consumer recycled content.
- Manufacturers have product-labeling systems to assist non-English speaking or illiterate personnel.

Dispensing Equipment

Desirable

It is **desirable** that Bidders provide an option for dispensing equipment that reduces worker exposure to chemicals and promotes the appropriate use of the cleaners.

Non-animal Testing

Desirable

It is **desirable** that Bidders products not be tested on animals. The PMT wants to discourage animal testing and will accept the results of past peer-reviewed or standard tests demonstrating compliance with a criterion. In addition, a mixture need not be tested (or retested) if existing information demonstrates that each of the ingredients complies with a criterion. The PMT may also accept non-animal (in-vitro) test results, providing that the test methods are referenced in peer-reviewed literature and the manufacturer provides the reasons for selecting the particular test method. (This section applies to Sections 4.1, 4.3, & 4.7 in the Green Seal Standard).

It is also **desirable** that manufacturers have a non-animal test policy in place, or plan to implement such a test policy in the near future.

Additional Information

Desirable

It is **desirable** that Bidders provide information as to whether their products contain ingredients that may be identified as asthma-causing agents (asthmagens). Such ingredients may include, but not be limited to:

Monoethanolamine (CAS 141-43-5)

Tall Oil or Rosin (CAS 8002-26-4)

Chlorhexidine (CAS 55-56-1)

Chloramine T (CAS 127-65-1)

Ammonium Quaternary Disinfectants (May include, but not be limited to the following CAS #s: 8001-54-5, 121—54-0, 122-18-9, 8044-71-1, 123-03-5, 122-19-0)

It is **desirable** that Bidders indicate whether any product being bid is a respiratory irritant or may aggravate existing respiratory conditions.

Corporate Environmental Commitment

Desirable

It is **desirable** that Bidders provide information concerning environmental initiatives being conducted or planned in other company operations. Such efforts may include, but not be limited to a Bidder who has:

- instituted a publicly available corporate environmental policy that can be measured by established goals
- implemented an environmental management system such as ISO 14001
- introduced recycled and/or environmentally preferable products into other operational areas, such as using:
 - recycled-content paper that meets the federal standards for all printing and publishing needs (e.g. brochures, advertising, catalogs)
 - attempting to promote renewable resources (e.g. bio-based products)
 - vehicle maintenance products (e.g. re-refined oil, antifreeze, retread tires) and/or alternative fuel vehicles for deliveries
 - Energy Star (energy efficient) office equipment

Product Specific Performance Requirements

The product performance requirements as established by the Green Seal standard GS-37 represents the minimum performance requirements for products submitted under this RFR. Each product *as used* when diluted with water from the cold tap at no more than 50°F, **must** clean common soils and surfaces in its category effectively, as measured by a standard test method. Green Seal recommends the following test methods:

General-purpose cleaners. The product **must** remove at least 80% of the particulate soil in the American Society for Testing and Materials (ASTM) D4488-95, A5.

Bathroom cleaners. The product **must** remove at least 75% of the soil in ASTM D5343 as measured by ASTM D5343.

Glass cleaners. The product **must** achieve at least a rating of three in each of the following categories established by the American Chemistry Council (formerly called the Chemical Specialties Manufacturers Association - CSMA) DCC 09: soil removal, smearing, and streaking. <http://www.americanchemistry.com>

References and Links

- <http://www.greenseal.org/>
- [EPA's EPP Web site](#)
- [GREENGUARD Environmental Institute](#)
- [The Woolsafe Organization](#)
- [GEN](#) – Global Ecolabeling Network
- [UTK](#) – Center for Clean Products and Clean Technologies
- [ISO](#) – International Organization for Standardization € ASTM - American Society for Testing and Materials € ANSI - American National Standards Institute
- [Center for a New American Dream/Procurement Strategies](#)
- [USGBC](#)
- [Federal Trade Commission Environmental Marketing Guidelines](#)
- [Consumer's Union eco-label site](#)

**STATE OF CONNECTICUT
BY HER EXCELLENCY
M. JODI RELL
GOVERNOR**

EXECUTIVE ORDER NO. 14

WHEREAS, cleaning and sanitizing products are necessary for creating and maintaining clean, healthy and sanitary conditions in State facilities and workplaces;

WHEREAS, exposure to harmful chemicals contained in cleaning and sanitizing products may result in potential impacts to human health;

WHEREAS, harmful chemicals, byproducts and waste contained in certain cleaning and sanitizing products may be released into the environment during the routine cleaning and sanitization of State facilities normal use;

WHEREAS, choosing less harmful cleaning and sanitizing products for use in State facilities and workplaces and taking steps to reduce exposure by office and custodial workers, will minimize potential impacts on human health, will improve environmental quality and will reduce pollution;

WHEREAS, the procurement and the proper use and application of cleaning and sanitizing products that perform well and that have positive environmental attributes such as biodegradability, low toxicity, low volatile organic compound content, reduced packaging, and low life cycle energy use will reduce the environmental impacts of routine cleaning and sanitizing activities while also ensuring clean and sanitary State facilities; and

NOW, THEREFORE, I, M. Jodi Rell, Governor of the State of Connecticut, by virtue of the authority vested in me by the Constitution and Statutes of the State, do hereby ORDER and DIRECT:

All state agencies in the executive branch shall procure and use, whenever practicable, cleaning and/or sanitizing products having properties that minimize potential impacts to human health and the environment, consistent with maintaining clean and sanitary State facilities.

All state agencies in the executive branch and all higher education agencies and institutions, shall, when procuring or contracting for cleaning and/or sanitizing services provide in such contracts or procurement agreements, require contractors of the State or persons or entities providing cleaning and/or sanitizing services to the State use cleaning and/or sanitizing products having properties that minimize potential impacts to human health and the environment, consistent with maintaining clean and sanitary facilities.

All state agencies in the executive branch shall include in new contracts for the procurement of cleaning products or cleaning services, an appropriate requirement

consistent with this Executive Order and the standards and guidelines established by the Department of Administrative Services under Paragraph 3 of this Executive Order.

The Department of Administrative Services, in consultation with the Department of Public Health, the Department of Public Works and the Department of Environmental Protection, shall not later than January 1, 2007, establish and publish written standards and guidelines to provide direction to all state agencies in the executive branch in connection with the implementation of this Executive Order.

The Department of Administrative Services shall provide the Office of the Governor with a report assessing the effectiveness of this Executive Order within one year of the effective date of this Executive Order.

Municipal governments, political subdivisions and school districts that are not expressly subject to the requirements of this Order are encouraged to review their purchasing and use of cleaning products and/or sanitizing products and are hereby urged to comply with the provisions of this Executive Order where deemed appropriate.

Municipal governments, political subdivisions and school districts that are not expressly subject to the requirements of this Executive Order are hereby requested and encouraged to review their procurement and use of cleaning and/or sanitizing products and are urged to comply with the provisions of this Executive Order. Such entities may to the extent they deem appropriate, in order to minimize potential impacts to human health and the environment, and consistent with maintaining clean and sanitary facilities seek guidance and assistance consistent with the provisions of Paragraph 3 of this Executive Order from the Departments of Administrative Services, Public Works, Public Health and Environmental Protection.

All state agencies in the executive branch covered by this Executive Order shall, wherever feasible, in a manner that is financially feasible, commercially reasonable and practicable, immediately transition to environmentally and health-friendly cleaning and/or sanitizing products. Such transition shall be accomplished as soon as possible and in a manner that avoids the waste of existing inventories, accommodates establishment of supply chains for new products, enables the training of personnel in appropriate work practices, and allows the phase-out of products and practices inconsistent with this Executive Order.

This Order shall take effect immediately.

Dated at Hartford this 17th day of April, 2006

M. JODI RELL

Governor