



Environmentally Preferable Cleaning Chemicals: A Buyer's Guide

One of the easiest and most important ways of protecting public health is to clean and maintain properly the spaces where people gather to work, play, and learn. Office buildings, schools, hospitals, shopping malls, and other public places are cleaned not simply to improve appearances. They are cleaned because clean buildings help protect human health.

Some of the products used to clean public buildings, however, can create health concerns for the building occupants and the janitorial workers who use them. Some ingredients can also present broader environmental concerns.

Luckily, safer "green" cleaning products are now widely available. They work just as well or better than other products and, in most cases, they do not cost any more than other products. They are readily available and easy to locate.

WHY SWITCH TO ENVIRONMENTALLY PREFERABLE PRODUCTS?

By switching to green cleaners, buyers can avoid cleaning products containing toxic chemicals, thereby avoiding the various environmental and health impacts and risks associated with their manufacture, use and disposal. For example, green cleaners can significantly improve indoor air quality, reduce cleaning-related health problems and absenteeism, and increase productivity and morale.¹ Health problems associated with some cleaning chemicals include headaches, dizziness, and fatigue. Although few in number, there are some cleaning chemicals that can cause reproductive disorders and major organ or permanent eye damage. In addition, some cleaning product ingredients can also trigger breathing difficulties for people with asthma or other respiratory ailments.² The U.S. Environmental Protection Agency (EPA) states that cleaning products "may contain volatile organic compounds (VOCs), which may escape to the atmosphere and react to form smog. Smog and other atmospheric pollutants have been shown to cause irritation of the eyes, nose, throat, lungs, and to cause asthma attacks. Many state and local authorities have restrictions on

the use of VOCs."³ Those who spend much of their time indoors, like students, patients, and office workers, are particularly susceptible to health problems caused by cleaning products. The four million janitors who keep North America's buildings clean also experience unnecessarily high injury rates with some experts estimating that 6 out of every 100 are injured by the chemicals they are using.⁴

Along with reducing the potential for negative indoor air quality impacts caused by chemicals, green cleaners can also avoid environmental impacts resulting from their improper disposal that may threaten water quality and plant and animal habitats. While most cleaning products should be formulated to degrade in municipal wastewater treatment plants, cleaning chemicals used to clean building exteriors can find their way into lakes, streams, and other water bodies, presenting potential health and other environmental concerns.

Some of the ingredients found in cleaning products that raise environmental or human health concerns include the following:

- ➔ Corrosive or strongly irritating substances found in some cleaning products can cause serious skin or eye damage if exposure occurs. Non-irritating products with neutral pH or adequate buffering capacity are widely available and suitable for many cleaning applications.
- ➔ Volatile Organic Compounds (VOCs) are found in many cleaning products. Certain VOCs can contribute to poor air quality indoors and outdoors, including smog formation. They can also cause asthma attacks in some people.

ARE ENVIRONMENTALLY PREFERABLE PRODUCTS AFFORDABLE?

In most cases, green cleaning products do not cost any more than other cleaners. Many organizations have discovered significant cost savings by switching to green cleaners. The City of Santa Monica, California, for example, documented a five percent price savings after its

switch to green cleaners.⁵ Other organizations, including McGill University and the Children's Hospital in Montreal, the Chicago Public School System and the states of Massachusetts, Minnesota, and Vermont also report that green cleaners are cost competitive.

Using green cleaning chemicals can actually produce additional savings when other benefits are taken into account. Switching to green cleaners, for example, can help reduce the more than \$75 million per year US institutions spend to address the chemical-related injuries of janitorial workers.⁶



ARE GREEN PRODUCTS AS EFFECTIVE AS OTHER PRODUCTS?

Green cleaning product standards frequently reference American Society for Testing and Materials (ASTM) or other industry standards for cleaning effectiveness. Such standard testing helps ensure the green products meet or exceed the performance standards of other cleaning products. In numerous tests conducted by a group of large volume purchasers, all of the green products bought by the group work as well or better than other cleaners.⁷ The City of Santa Monica, the Chicago Public School

System, and other institutions and government agencies have reported similar successful use of the green products in controlled on-site evaluations.

Green cleaners, like all cleaning products, work best when used as directed. Some cleaning products, for example, work best when applied directly to the surface being cleaned. Others work best when applied with a cleaning cloth. Anytime one cleaning product is substituted for another—whether or not a green cleaning product is being substituted—the workers using the product must be trained to use it properly.



For a list of over 200 cleaning products from more than 80 manufacturers certified as meeting the Green Seal and Eco-Logo standards, visit:
[<www.greenseal.org/findaproduct/#cleaners>](http://www.greenseal.org/findaproduct/#cleaners)
[<www.ecologo.org/en/seeourcriteria/details.asp?ccd_id=371>](http://www.ecologo.org/en/seeourcriteria/details.asp?ccd_id=371)

HOW CAN PURCHASERS IDENTIFY ENVIRONMENTALLY PREFERABLE PRODUCTS?

There are several programs to help purchasers identify green products. Some include specific criteria to define green products and evaluation and verification procedures to identify products meeting the standard. Others provide assistance to manufacturers to help them improve the environmental performance of their products or define protocols to help manufacturers evaluate and improve their products.

Standard Setting and Certification Programs

Green Seal and the Eco-Logo Program (also known as Environmental Choice), both members of the Global Ecolabelling Network <www.gen.gr.jp>, have established explicit leadership standards to define green cleaning products.

The standards are developed in an extensive, multi-stakeholder process consistent with the ISO 14020 and 14024 environmental label guidelines. Standards are regularly reviewed and updated. Both programs conduct on-site audits as part of their certification process.

EPA and Other Programs

The US EPA's Design for the Environment (DfE) Formulator Program <www.epa.gov/dfe> works with cleaning product manufacturers and other chemical product formulators interested in improving the environmental and health profiles of their products. The DfE program will review a manufacturer's ingredients and recommend safer alternatives based on detailed criteria (available at: <www.epa.gov/dfe/pubs/formulat/formulator-review1.pdf>).

For a list of companies working with EPA's Design for the Environment Formulator Program and the more than 350 products eligible to use the DfE logo, visit <www.epa.gov/dfe/pubs/projects/formulat/formpart.htm>.

Companies that reformulate their products based on DfE recommendations are eligible to use the DfE logo on their product. The logo indicates that the DfE review team has screened each ingredient in the product for potential human health and environmental effects and that—based on currently available information, predictive models, and expert judgment—the product contains only those ingredients that pose the least concern among chemicals in their class. More than 350 products from more than 80 companies are currently eligible to use the logo. Many of the products recognized by DfE are also certified by Green Seal or the EcoLogo Program.

In addition, NSF International has a product development process/environmental management system standard for hard surface cleaners that are designed to help manufacturers improve the environmental performance of their products. The standard provides a product stewardship practice guide that enhances a manufacturer's capability to minimize health and environmental impacts at all stages of the product life cycle. Additional information on the NSF standard is available at <<http://webstore.ansi.org/ansidocstore/product.asp?sku=NSF%2FANSI+143-06>>.

HOW CAN PURCHASERS COMPARE GREEN CLEANER STANDARDS?

When purchasing cleaning products, the overall best value takes into account performance, price, availability, regulatory requirements, and environmental impact. Purchasers should examine as many relevant product attributes as possible, recognizing that tradeoffs are inevitable. For example, one product may be made with renewable resources (a desirable characteristic), while another product has a lower VOC content (also a desirable characteristic). Purchasers have to make a decision about the overall best value, taking into account their own organization's policies and priorities.

Purchasers should be especially careful in interpreting vague or generic claims such as "environmentally friendly," "green," "eco safe," etc. Purchasers always have the option to ask vendors and manufacturers offering green cleaning products to clearly and specifically define their green claims.

There are also programs like DfE, EcoLogo and Green Seal that have done all the work of assessing product issues for the buyer by providing a list of criteria and issues for different categories of products.

So how can you make an informed purchasing decision? Consider this list of attributes, in addition to price and performance, when selecting environmentally preferable cleaning products. Many organizations incorporate some of these attributes into their cleaning service contract specifications.

→ **Product content and use.** Minimal presence of, or exposure to, potentially harmful chemicals, such as corrosive or strongly irritating substances, persistent, bio-accumulative, substances classified as known or likely human carcinogens or reproductive toxicants by authorities such as the National Toxicology Program, the US EPA, or the International Agency for Research on Cancer, regulated hazardous materials; use of renewable resources, such as biobased solvents from citrus, seed, vegetable, and pine oils; low VOC content e.g., < 10% ; biodegradable by standard methods and definitions, e.g., ready biodegradability as defined by the Organization for Economic Cooperation and Development ("ready biodegradability" is a definition meant to ensure that a material degrades relatively quickly in an aquatic aerobic environment); low toxicity in aquatic species such as fish or aquatic invertebrates; low flammability, e.g., flash point > 200 °F; designed for use in cold water in order to conserve energy; limit use of disinfectants to areas where

people are likely to come into contact with contaminated surfaces (e.g., bathroom fixtures, doorknobs, other high-touch surfaces); conduct training on proper use of products.

→ **Product packaging and shipping.** Concentrated formulas with appropriate handling safeguards; efficient packaging (e.g., light weight, reduced volume); recyclable packaging (when applicable); recycled-content packaging; refillable bottles; pump sprays rather than aerosols; packaging and dilution systems designed to reduce exposure to the product; products shipped in bulk; clear labeling and information on use and disposal.

→ **Corporate environmental performance.** Does the company have a formal environmental management system (e.g., steps to reduce waste and emissions, efficient use of energy and materials, use of alternative fuels or renewable energy)? Does the company have International Organization for Standardization (ISO) 14001 certification? Does the company have a formal partnership with the Design for the Environment Formulator Initiative? of alternative fuels or renewable energy)? Does the company have International Organization for Standardization (ISO) 14001 certification? Does the company have a formal partnership with the Design for the Environment Formulator Initiative?

ARE THERE OTHER ASPECTS TO GREEN CLEANING?

It is important to recognize that there is more to green cleaning than switching to green cleaning chemicals. Those are only part of the story. The following additional factors are also important:

→ **Improve employee training.** It is especially important to ensure janitorial workers are properly trained. According to several green cleaning experts, 90 percent of a cleaning budget is labor costs with only two to five percent related to chemical costs.

If the workers are not using products properly (whether they are using green products or not), facilities could be spending more than necessary and miss the greatest opportunities to protect human health, the environment, and the value of the building.

→ **Use better cleaning equipment.** Many green cleaning guidelines emphasize the importance of placing doormats at entryways to reduce the amount of dirt entering a building. They also encourage the use of microfiber mops and cloths to reduce the need for cleaning chemicals. Experts also promote the use of high efficiency filtration vacuum cleaners to reduce the dust generated by older vacuum technologies.

→ **Modify cleaning protocols.** Building owners are modifying cleaning routines to move away from strict schedules for certain highly polluting cleaning activities like floor stripping. Instead, they are adopting more flexible schedules that allow floors to be stripped only when needed. This strategy is being adopted by a number of large building owners and encouraged by the US Green Building Council's LEED standard for existing buildings. See <www.usgbc.org>.

→ **Use recycled-content and bio-based products.** US federal agencies and others using federal funds are required to buy recycled-content products, including such janitorial supplies as paper towels, tissue products, and trash bags. The US EPA recommends recycled-content percentages for these and other products at <www.epa.gov/cpg>.

US federal purchasers are also required to purchase biobased products designated under the US Department of Agriculture's new Biopreferred Program. While no janitorial supplies have yet been designated, a variety of janitorial products are expected to be designated in the near future. Several major categories of janitorial products have been proposed for designation by USDA, including glass cleaners, bath and tile cleaners, carpet cleaners, floor strippers, and hand cleaners. Once these designations are issued as final rules, these items will become mandatory purchase items for US federal agencies and their contractors.

It should be noted, however, that biobased products are not inherently environmentally preferable and should be judged on their set of attributes, including price and performance. For additional information, visit <www.biobased.oce.usda.gov>.

For additional information on green cleaning training and work practices, review the Pennsylvania Green Building Operations and Maintenance Manual <www.dgs.state.pa.us/dgs/lib/dgs/green_bldg/greenbuildingbook.pdf>. Many of the practices Pennsylvania recommends are incorporated by the ASTM E1971-05 Standard Guide for Stewardship for the Cleaning of Commercial and Institutional Buildings <www.astm.org>. The practices are becoming common enough that purchasers are beginning to reference the ASTM standard in their purchasing requirements in addition to requiring contractors to use certified green cleaning products.

¹ William Fisk and Arthur Rosenfeld, "Improved Productivity and Health from Better Indoor Environments," Center for Building Science Newsletter (now *The Environmental Energy Technologies Newsletter*), Lawrence Berkeley Labs, Summer 1997, 5, <etd.lbl.gov/cbs/newsletter/NL15/productivity.html>; EPP Update, April 2000. Available online at <www.epa.gov/oppt/epp/pubs/update6.pdf>.

² Culver, Alicia et al. "Cleaning for Health: Products and Practices for a Safer Indoor Environment." INFORM, Inc.: 2002; US EPA. "Targeting Indoor Air Pollution: EPA's Approach and Progress." September 1992. EPA-400-R-92-012.

³ US EPA. Environmentally Preferable Purchasing. Green Cleaner Attributes. Accessed June 17, 2007. <www.epa.gov/oppt/epp/pubs/products/cleanattrib.htm#air>.

⁴ Culver, Alicia et al. 2002, op. cit.

⁵ US EPA. "The City of Santa Monica's Environmental Purchasing: A Case Study." March 1998. Available online at <www.pestinfo.ca/documents/santamonica.pdf>; US EPA "Green Cleaning Products Outshine the Competition." EPP Update. April 2000. Available online at <www.epa.gov/oppt/epp/pubs/update6.pdf>.

⁶ Janitorial Products Pollution Prevention Project. "How to Select and Use Safe Janitorial Chemicals." US EPA Region X, California EPA and County of Santa Clara: December 1999. Available online at <[www.wrppn.org/Janitorial/05%20Report.pdf](http://wrppn.org/Janitorial/05%20Report.pdf)>.

⁷ Commonwealth of Massachusetts. Request for Response for Environmentally Preferable Cleaning Products (RFP #GR016). Awarded April 2003. Available online at <www.newdream.org/procure/products/MassRFP.pdf>.



WHERE IS ADDITIONAL INFORMATION AVAILABLE?

For additional information about safer cleaning products, visit the following resources:

- ➔ Carpet and Rug Institute <www.carpet-rug.org> — Provides information on carpet care and cleaning, including an indoor air quality testing program for vacuum cleaners.
- ➔ Center for a New American Dream <www.newdream.org/clean> — Includes background materials on the history of the green cleaning movement and an extensive green cleaning resource list.
- ➔ Consumer Specialty Products Association <www.cSPA.org> — Contains information on products that help provide a cleaner and healthier environment.
- ➔ Design for the Environment Formulator Initiative <www.epa.gov/dfe> — Provides information on a US Environmental Protection Agency program to help cleaning chemical manufacturers design products with more positive human health and environmental profiles.
- ➔ EcoLogo[®] Program <www.ecologo.org> — Includes information on the EcoLogo[®] green cleaning standards and links to manufacturers making products meeting the standards.
- ➔ Green Seal <www.greenseal.org> — Provides information on the Green Seal green cleaning standards and links to manufacturers making products meeting its standards.
- ➔ INFORM, Inc. <www.informinc.org> — Links to a comprehensive guide to environmentally preferable cleaning products and methods that have been used effectively in office buildings, schools, and hospitals in Canada and the United States.
- ➔ ISSA <www.issa.com> — Provides information on green cleaning including a list of the green cleaning product procurement policies and initiatives in the United States.
- ➔ Janitorial Products Pollution Prevention Project <www.mass.gov/epp/products/cleaning.htm> — Distributes information on a wide range of safer janitorial products and work practices that was developed

in a project supported by the US Environmental Protection Agency, California Environmental Protection Agency, and several California cities and counties.

- ➔ The Soap and Detergent Association <www.cleaning101.com> — Contains information on a range of cleaning product topics, including health, safety, and environmental issues.
- ➔ Office of the Federal Environmental Executive <www.ofee.gov/gp/greenjanitorial.html> — Highlights a variety of initiatives throughout the Federal government to improve cleaning practices, including contract language and an impressive variety of green cleaning presentations.



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What is the North American Green Purchasing Initiative?

The Commission for Environmental Cooperation (CEC) launched the North American Green Purchasing Initiative (NAGPI) to harmonize green product standards and practices throughout North America. NAGPI is working closely with public, private, and non-profit organizations to harmonize green standards and specifications throughout North America. NAGPI is structured as a "network of networks," which allows it to quickly gather information, facilitate agreement, and distribute the resulting consensus with large segments of the green purchasing community. For additional information on NAGPI, visit www.cec.org/nagpi.

The CEC is an international organization created by Canada, Mexico, and the United States under the North American Agreement on Environmental Cooperation (NAAEC). The CEC was established to address regional environmental concerns, help prevent potential trade and environmental conflicts, and to promote the effective enforcement of environmental law. The Agreement complements the environmental provisions of the North American Free Trade Agreement (NAFTA). For additional information, visit www.cec.org.