

# What Hoteliers Should Know about Green Cleaning Products and Practices

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Many hotels are turning to green cleaning products and practices to improve indoor air quality, reduce risk to building occupants, improve environmental performance and obtain a marketing advantage. This report is intended to help hoteliers determine whether to follow suit at their properties and how to do so.

## **I. What are the problems associated with traditional cleaning products and practices?**

The rise of the green cleaning movement stems from health and environmental concerns associated with the traditional cleaning industry and its practices.

There is a growing recognition that people harbor many synthetic chemicals, including ones found in cleaning products. “Scientists estimate that everyone alive today carries within her or his body at least 700 contaminants.”<sup>1</sup> Some of these substances are considered benign, some are known to be hazardous and most have not been well studied.

At the same time, hoteliers and other building managers have become more concerned about indoor air quality. Traditional cleaning products have been identified as part of this problem, along with other chemicals, HVAC issues, building design flaws and occupant activities such as smoking.

Serious health problems are linked to cleaning product chemicals. Some chemicals emit a high level of volatile organic compounds (VOCs) that are associated with, “eye, nose, and throat irritation; headaches, loss of coordination, nausea; damage to liver, kidney, and central nervous system... some are suspected or known to cause cancer in humans.”<sup>2</sup> Cleaning product chemicals that are causes for concern “include butane, chlorine, formaldehyde, hydrochloric acid, and perchloroethylene...”<sup>3</sup>

A 2005 Carnegie Mellon University Center for Building Performance review of research on the link between green cleaning and productivity, “identified 17 separate studies documenting a reduction in reported symptoms of asthma, flu, sick building syndrome, respiratory problems and headaches that ranged from 13.5 to 87 percent — an average improvement of 41 percent.”<sup>4</sup>

The Canadian Lung Association identified cleaning chemicals as a trigger for asthmatics. The Barcelona Municipal Institute of Medical Research found that female housekeepers had more than twice the rate of respiratory problems as non-housekeepers.<sup>5</sup> People with Multiple Chemical Sensitivity react mainly to petroleum-based chemicals, which are present in many traditional cleaning products.

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<sup>1</sup> Onstot J, Ayling R, Stanley J. Characterization of HRGC/MS Unidentified Peaks from the Analysis of Human Adipose Tissue. Volume 1: Technical Approach. Washington, DC: U.S. Environmental Protection Agency Office of Toxic Substances (560/6-87-002a), 1987, as reported in [www.chemicalbodyburden.org/whatisbb.htm](http://www.chemicalbodyburden.org/whatisbb.htm).

<sup>2</sup> An Introduction to Indoor Air Quality, Organic Gases (Volatile Organic Compounds - VOCs), U.S. Environmental Protection Agency, [www.epa.gov/iaq/voc.html](http://www.epa.gov/iaq/voc.html).

<sup>3</sup> Clean Up Your Cleaning Act with Nontoxic, Natural Products, Kit Cassingham, Green Lodging News, March 29, 2009.

<sup>4</sup> Proving The Value And Effectiveness Of Green, Stephen Ashkin, CleanLink, May 2007.

<sup>5</sup> The Truth About Cleaning Chemicals and 'Green' Cleaning, Denise Levesque, Green Lodging News, September 13, 2007.

Statistics on the impact of cleaning products and related chemicals on health are telling. Cleaning products were responsible for nearly 10 percent of all toxic exposures reported to U.S. Poison Control Centers in 2000, accounting for 206,636 calls.<sup>6</sup> “A review of workers compensation data from Washington State indicates that six out of 100 janitors are injured by chemicals every year; 20 percent of these injuries are serious burns to the eyes or skin.”<sup>7</sup>

Toxic chemicals do not just impact hotel staff. They linger in rooms for hours or days, and make contact with hotel guests, too.

Industrial cleaning products adversely impact the environment, too. They pollute our bodies of water, use energy unnecessarily and needlessly generate solid waste.

Green cleaning products and practices diminish the health and ecological issues noted above. When incorporated into a hotel’s indoor air quality program, they lead to a healthier indoor environment, with all of its benefits.

## **II. What is meant by “green cleaning products and practices?” What are the benefits of using them?**

President Clinton’s 1993 Executive Order 13101 defined green cleaning as “the use of products and services that reduce the health and environmental impacts compared to similar products and services used for the same purpose.”<sup>8</sup> That definition is still the most common one used today.

Regarding human health, green-certified cleaning products have the following characteristics: low toxicity, they do not bio-accumulate, they are not carcinogenic, they do not contain chemicals associated with harm to the reproductive system, they are not corrosive to skin or eyes and they do not cause allergic contact dermatitis. They have a high flashpoint. Also, they are beneath the threshold for VOCs, meaning that they do not off-gas beyond the recommended level.

Green-certified cleaning products also meet environmental standards such as low toxicity to aquatic life and aquatic biodegradability. Some product certification agencies oblige green cleaning products to be highly concentrated, because such products require less energy to transport, thereby reducing greenhouse gas emissions and air pollution; and they greatly reduce packaging, resulting in less solid waste.

There is one other category of green cleaning products worth mentioning: housekeeping supplies, like paper towels and toilet paper. They are considered to be environmentally-friendly when they are made from recycled materials, and not bleached with chlorine.

Green cleaning is defined by housekeeping practices, too. For example, airborne dust is reduced and indoor air quality improved by the proper use of entrance mats, and vacuuming with certified equipment.

A study performed for the EPA by the Research Triangle Institute showed that, “an organized cleaning program based upon environmental management principles and fundamental

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<sup>6</sup> Worldwatch Institute website, What’s Behind the Shine, [www.worldwatch.org/node/1484](http://www.worldwatch.org/node/1484).

<sup>7</sup> Janitorial Products Pollution Prevention Project, *How to Select and Use Safe Janitorial Chemicals*, December 1999, viii, [www.westp2net.org/Janitorial/105%20Report.pdf](http://www.westp2net.org/Janitorial/105%20Report.pdf).

<sup>8</sup> Green Cleaning’s Roots, Robert Kravitz, Sanitary Maintenance, June 2006.

environmental protection guidelines contributed to improved indoor air quality through reduction of total suspended particles, total volatile organic compounds, and culturable bacteria and fungi.”<sup>9</sup>

Studies show that worker productivity improves along with indoor air quality. One analysis showed that, “the potential decreases in adverse health effects from improvements in indoor environments to be 10 to 30 percent for infectious respiratory disease, and allergy and asthma symptoms and 20 to 50 percent for SBS [sick building syndrome] symptoms. The potential direct increase in office workers' performance was estimated to range between 0.5 and 5 percent.”<sup>10</sup>

Another analysis pointed out that, “researchers have determined that the impact of the indoor environment on worker productivity can result in a savings of three to 34 minutes per day, per worker. BOMA (Building Office and Managers Assn.) estimates the cost of salaries and benefits per square foot in a “Class A” office building are nearly \$150. Thus, a three-minute-per-day increase in productivity results in \$0.75 per sq. ft. saved.”<sup>11</sup>

Of course, cleaning is only one of several factors that impact a hotel’s air quality.

### **III. What is the history of green cleaning products and practices? Are they now commonplace?**

Concern about industrial chemicals goes back to Rachel Carson’s *Silent Spring*, published in 1962. However, the green cleaning industry did not get a substantial foothold until 1993. Executive Order 13101 required green cleaning products to be used at all federal facilities. Other developments soon followed.

The green building movement is one of the forces behind the growth of the green cleaning industry. The U. S. Green Building Council created the LEED-EB certification which requires a green cleaning policy and gives points for the use of green cleaning products and practices.

The creation of specific green cleaning product certifications was even more important, because they provided guidelines for manufacturers, distributors and users. Each group responded strongly. Today, there are more than “100 manufacturers of commercial cleaning chemicals that have certified products from Green Seal, Environmental Choice and GreenGuard totaling several hundred products.”<sup>12</sup>

Six states now require their schools to use cleaning products certified by Green Seal or Ecologo.<sup>13</sup> Other governments, including the State of Massachusetts, use purchasing contracts to boost the use of these products in their buildings. In July 2008, Boston’s Mayor Menino decreed that, “city departments must purchase only environmentally friendly cleaning products, hire only cleaning contractors with a specific "green" certification...”<sup>14</sup>

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<sup>9</sup> Research Triangle Institute, *Indoor Environment Characterization of a Non-Problem Building: Assessment of Cleaning Effectiveness* (report prepared for the US EPA Environmental Criteria and Assessment Office), 1994, iii.

<sup>10</sup> 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, <http://eetd.lbl.gov/cbs/newsletter/NL15/productivity.html>.

<sup>11</sup> Why Green Cleaning is Important to Facility Managers, Steve Ashkin, July 7, 2006.

<sup>12</sup> The Greening of Consumer Products, Stephen Ashkin, *ContractingProfits*, April 2008.

<sup>13</sup> States Active In Green Cleaning Legislation, Nick Matkovich, *Sanitary Maintenance*, June 2009.

<sup>14</sup> Menino: Boston City Hall will go green, John C. Drake, *The Boston Globe*, July 3, 2008.

Many hotels now use green cleaning products, too. The Kimpton, Fairmont and Starwood Element chains are committed to using them.<sup>151617</sup> It is common for hotels to mention their use of these products in their marketing material.

Some experts believe that green cleaning will soon take over the market. UGL Unicco, one of the nation's largest facility maintenance services says that, "In a few years it is predicted that the entire cleaning industry will see Green Cleaning as the norm."<sup>18</sup>

The green chemistry field is young, and cleaning products are still evolving. Many new and better products are in the pipeline.

#### **IV. How well do green cleaning products work? How much do they cost?**

The cleaning capability of green products can best be measured by testing them in one's facility. Still, there are reasons to believe that they hold up well when compared to traditional products. Certifying agencies, such as Green Seal, EcoLogo, or EPA's Design for the Environment Program test products for effectiveness, besides health and environmental considerations. Also, the widespread adoption of such products by hoteliers and nationwide cleaning services like OneSource and UGL Unicco suggests that they must meet high standards. Another indication is that over 100 companies now offer certified green cleaning products.

Choosing green cleaning products is not an all-or-nothing proposition. Some hotels use traditional products for some jobs and green products for others. Others use green products on a daily basis, and keep traditional products in reserve for use as needed. Fore example, some stains might respond best to cleaners that are more acidic or more alkaline than green cleaning products.

Do green cleaning products cost more to purchase? Some sources indicate that costs are now comparable. Circumstances vary and prices change frequently, so hoteliers should make price comparisons for themselves. Hoteliers should consider the indirect costs of these products, too. As noted above, there is some evidence that green cleaning programs reduce indirect costs by improving productivity and reducing absenteeism.

Another argument is that green cleaning results in, "reduced liability in the forms of fewer litigation dollars caused by 'sick building' lawsuits and lower insurance premiums, better value creation for tenants and increased property value..."<sup>19</sup> An author from OneSource, a nationwide cleaning company, claims that, "appropriate, gentler cleaning and preventative maintenance keeps assets newer longer."<sup>20</sup>

#### **V. How to convert to green cleaning products and practices**

An easy and reliable way to identify green cleaning products is to review the products listed by the most respected certifying agencies, Green Seal and the Environmental Choice Program, which uses

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<sup>15</sup> More Hotels Go Green and Take the Environmental Route, Terri Rimmer, Associated Content, March 12, 2006.

<sup>16</sup> A Leader in Sustainable Tourism: The Fairmont Luxury Hotel & Resort Chain Promotes Green Travel, Jennifer W. Miner, suite101.com, Apr 12, 2007.

<sup>17</sup> Starwood Hotels ELEMENT Brand to Mandate LEED Certification in All Hotels Brand-Wide, Sam Leppanen, Green by Design, April 21, 2008

<sup>18</sup> UGL Unicco website, [www.greencleaning.com/faqs/index.asp](http://www.greencleaning.com/faqs/index.asp).

<sup>19</sup> Why Green Cleaning is Important to Facility Managers, Steve Ashkin, Green Lodging News, July 7, 2006.

<sup>20</sup> The business case for green cleaning, Charlotte Jensen-Murphy, OneSource, San Diego Daily Transcript, February 8, 2007.

the EcoLogo certification. The list of Green Seal approved products is at [www.greenseal.org/findaproduct/i&icleaners.cfm](http://www.greenseal.org/findaproduct/i&icleaners.cfm). Products that have earned the EcoLogo are listed at [www.terrachoice-certified.com/en/certifiedgreenproducts/category.asp?category\\_id=21](http://www.terrachoice-certified.com/en/certifiedgreenproducts/category.asp?category_id=21). A chart comparing the criteria used by these companies for assessing green cleaning products is at [www.enviro-solution.com/envirosound/cleanercomparison.html](http://www.enviro-solution.com/envirosound/cleanercomparison.html).

One reason that these certifications are important is that some companies make misleading claims about the green nature of their products. When purchasers buy products certified by Green Seal or EcoLogo, they know that the products meet a very high standard. Still, some green cleaning products are not certified. There are several reasons: the product is new and not yet certified, the company that produces it has chosen not to pay the considerable fee that Green Seal and the Environmental Choice Program charges to evaluate it, or that they do not meet the criteria used by the certifying organizations.

Material Safety Data Sheets (MSDS) are another tool that helps hoteliers decide which cleaning products to use and how to use them. For example, the MSDS's indicate which products are carcinogenic. Hoteliers could decide to use alternatives, because non-carcinogenic substitutes are always available. Similarly, when an MSDS indicates that a product contains chemicals on the Toxics Release Inventory ([www.epa.gov/TRI/](http://www.epa.gov/TRI/)), hoteliers could decide not to use it.

Hoteliers should also be concerned about any product that carries a risk of severe disease or injury. They can compare the MSDS's for products that have a similar function and favor the ones that have the least harmful health and environmental impacts. It is also sensible to avoid products with an extreme PH of more than 11 or less than 2, and those with flash points below 140 to 200 degrees.

The MSDS's do not list all hazards. For a more complete picture, hoteliers could call the customer service departments of the chemical suppliers.

Some MSDS forms and product labels list a product's HMIS (Hazardous Materials Identification System) number. In this system, products are rated on health, flammability, reactivity and the need for protective equipment. It uses a 0 to 4 scale, with 0 being the safest.

There are several other resources that enable hoteliers to learn more about chemicals in their cleaning products. The U.S. Department of Health and Human Service's Agency for Toxic Substances and Disease Registry (ATSDR) has information about many toxic chemicals at [www.atsdr.cdc.gov/toxfaq.html#p](http://www.atsdr.cdc.gov/toxfaq.html#p). Another good checklist is the Commonly Used Hazardous Chemicals in the PowerPoint presentation, "Implementing Safer Cleaning Chemicals," slides 59 to 68. To find that report, go to [www.enviro-solution.com/resourcecenter/technicalreports.html](http://www.enviro-solution.com/resourcecenter/technicalreports.html)<sup>21</sup> and click the link on 1.j.

Thus far, this section has been devoted to greener cleaning products. It is also important to discuss other products and practices associated with green cleaning. Disinfectants, sanitizers and sterilizers, used to kill microorganisms on inanimate surfaces, require particular attention. Some of them are among the most toxic chemicals available.

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<sup>21</sup> Implementing Safer Cleaning Chemicals ...Safer For People And The Environment, www.ENVIRO-SOLUTION.com

The EPA regulates these antimicrobials, and they register products that do not have “unreasonable adverse effects to human health or the environment.”<sup>22</sup> Still, even EPA registered products are hazardous for humans and the environment. Also, some scientists are concerned that their overuse leads to bacteria that are resistant to standard antibiotics. Thus, it is recommended that hotels use only EPA-registered antimicrobials and only when necessary. The “environmental and health impacts [of antimicrobials] can be reduced by using proper cleaning and worker protection techniques, making appropriate choices about which disinfectants are necessary under what circumstances and substituting nontoxic or less toxic alternatives whenever possible.”<sup>23</sup>

Some hospitals have recently begun to use ultraviolet rays to disinfect their facilities. It is possible that this non-chemical strategy will be useful for hotels, too.

When hotels change cleaning and antimicrobial products, it is important to train their staff on how to apply and use them, mix them, dilute them and dispose of them. Even some green cleaning products can be hazardous if not handled properly.

Vacuuming is another component of a green cleaning program. Vacuums that earn the Carpet and Rug Institute Seal of Approval ([www.carpet-rug.org/commercial-customers/cleaning-and-maintenance/seal-of-approval-products/vacuums.cfm](http://www.carpet-rug.org/commercial-customers/cleaning-and-maintenance/seal-of-approval-products/vacuums.cfm)) improve indoor air quality by removing soil, reducing dust and retaining carpet fibers. Vacuums with HEPA filtration systems meet even more stringent criteria—they capture 99.9 percent of dust, pollen and other airborne particles. Some types of hard floor-care equipment excel at capturing dust, too. Hotels pay a premium for such equipment.

Entrance matting also has a beneficial impact on air quality. “Proper entrance matting can prevent up to 80 percent of dust, dirt and soil from entering the building where it can become airborne.”<sup>24</sup>

For a more complete description of green cleaning practices that improve indoor air quality, see the INFORM report, “Cleaning for Health, Products and Practices for a Safer Indoor Environment,” which is at [www.informinc.org/reportpdfs/chp/CleaningForHealth.pdf](http://www.informinc.org/reportpdfs/chp/CleaningForHealth.pdf).<sup>25</sup> Chapter 2 is particularly relevant. Another good resource is the Green Seal Environmental Standard for Commercial and Institutional Cleaning Services. The complete version of this document is at [www.greenseal.org/certification/cleaning\\_services\\_gs\\_42.pdf](http://www.greenseal.org/certification/cleaning_services_gs_42.pdf). The summary version is at [www.greenseal.org/resources/g42\\_one\\_pager.pdf](http://www.greenseal.org/resources/g42_one_pager.pdf).

Another aspect of a facility’s green cleaning program is the paper products it buys. Hotels save trees and reduce environmental toxins when they purchase unbleached, recycled-content paper. Green Seal and EcoLogo certify paper products that meet their high standards.

Recycled-content paper often costs slightly more than paper made from virgin tree fiber. “To minimize the cost, replace multifold hand towels with large rolls and replace single roll toilet paper

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<sup>22</sup> US EPA, “Antimicrobial Pesticide Products.”

<sup>23</sup> Cleaning for Health, Products and Practices for a Safer Indoor Environment, Alicia Culver, Marian Feinberg, David Klebenov, Judy Musnikow, Lara Sutherland, INFORM, Inc., 2002.

<sup>24</sup> Green Cleaning Helps Improve IAQ, CP Editorial Staff, ContractingProfits, January 2009.

<sup>25</sup> Cleaning for Health, Products and Practices for a Safer Indoor Environment, Alicia Culver, Marian Feinberg, David Klebenov, Judy Musnikow, Lara Sutherland, INFORM, Inc., 2002.

dispensers with dispensers that hold multiple rolls. These simple steps can reduce consumption 5 percent to 10 percent, thus offsetting the higher first cost for high quality recycled paper.”<sup>26</sup>

There are other ways that cleaning programs reduce waste: by using reusable cleaning cloths or microfiber technology instead of disposable paper products, removing trash liners only as needed, purchasing recycled-content trash liners and recycling the waste from their operations.

## **VI. Resources**

**The Business of Green Cleaning**, by Stephen Ashkin and David Holly. It is “designed to help facility managers and others make a successful, trouble-free, and uncomplicated transition to a green cleaning program. The book features scores of practical green cleaning tips and a collection of 25 public- and private-sector green case studies from around the world.”<sup>27</sup> It can be purchased at [www.ifmafoundation.org/programs/pubs.cfm](http://www.ifmafoundation.org/programs/pubs.cfm).

**Cleaning for Health: Products and Practices for a Safer Indoor Environment**, Alicia Culver, Marian Feinberg, David Klebenov, Judy Musnikow, Lara Sutherland, INFORM, Inc., 2002, [www.informinc.org/reportpdfs/chp/CleaningForHealth.pdf](http://www.informinc.org/reportpdfs/chp/CleaningForHealth.pdf).

**Green Cleaning, A Roadmap for Implementation**, Steve Ashkin, Executive Director, Green Cleaning Network, [www.facilitiesnet.com/webcasts/details.asp?id=14982](http://www.facilitiesnet.com/webcasts/details.asp?id=14982). This is a free, 75-minute webcast.

**GS-42 Green Seal Environmental Standard for Cleaning Services**, First Edition, September 1, 2006, [www.greenseal.org/certification/cleaning\\_services\\_gs\\_42.pdf](http://www.greenseal.org/certification/cleaning_services_gs_42.pdf).

**Managing Housekeeping Operations**, American Hotel & Lodging Educational Institute (EI). [www.eiacademic.com/productview.aspx?id=21146&terms=Managing+Housekeeping+Operations](http://www.eiacademic.com/productview.aspx?id=21146&terms=Managing+Housekeeping+Operations). See the chapter on green housekeeping.

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<sup>26</sup> Getting Green, Shade by Shade While Keeping Your “Triple Bottom Line” in the Black, Stephen P. Ashkin, July 7, 2006.

<sup>27</sup> Experts Author New Book, ‘The Business of Green Cleaning,’ Green Lodging News, November 25, 2008.