

By Scot Case

Breathing Easier

Buying Better Products to Protect Indoor Air Quality

When most people think about air pollution, they think about the outdoors. Government purchasers, however, are increasingly focused on indoor air pollution because it is a more significant human health threat than outdoor air pollution.

Many of the products governments buy routinely – including computers, copiers, printers, furniture, carpet, paint, cleaning products and more – can harm indoor air quality. These purchases affect the quality of the air people breathe when visiting or working at government facilities.

To better protect indoor air quality, government purchasers are improving specifications and demanding healthier, low-emitting products while continuing to meet other price, performance, availability and environmental requirements.

INDOOR AIR POLLUTION

The typical American spends more than 90 percent of his or her time indoors where, according to the U.S. Environmental Protection Agency, air pollution is typically two to five times – and occasionally more than 100 times – worse than outdoor air pollution.

Tobacco smoke used to be the most significant known indoor air pollutant. Now that people understand the dangers of tobacco smoke, smoking has been banned inside most public places. Policy makers are only now beginning to understand and focus on other threats to indoor air quality.

One of the most significant sources of indoor air pollution is the products we buy and bring inside. Products emit a variety of pollutants. According to Environment and Human Health, Inc., a nonprofit organization focused on human health and the environment, products emit a variety of chemicals known to be “respiratory stressors, neurotoxins, carcinogens, reproductive hazards, hormone mimics and developmental toxins.”

“Product off-gassing is a significant concern,” explains

Henning Bloech, executive director of the GREENGUARD Environmental Institute. GREENGUARD is a third-party organization owned by UL Environment that certifies products and materials for low chemical emissions.

“Some of the chemicals being released by new products are known health hazards,” Bloech continues, “including formaldehyde, acetaldehyde, xylene, toluene and benzene. Other chemicals that off-gas from products haven’t been evaluated for their short- and long-term health impacts. This means that, every time we expose ourselves to these new chemicals, we’re taking a risk with our health.”

Volatile organic compounds (VOCs) are one of the more common indoor air pollutants. VOCs are emitted as gases from a variety of products, such as paints, cleaning products, building materials (e.g., drywall, insulation and flooring), furniture and office equipment (e.g., computers, copiers and printers, correction fluids, glues and adhesives and markers).

Exposure to volatile organic compounds (VOCs) can create short- and long-term health issues, including:

- > headaches
- > nosebleeds
- > respiratory irritation
- > eye and throat discomfort
- > nausea
- > cognitive impairments
- > reproductive and developmental disorders
- > cancer

Asthma can be triggered by exposure to VOCs or other indoor air pollutants. There are more than 13 million asthma-related medical visits every year in the United States, including average hospital stays of 3.2 days, according to the U.S. Centers for Disease Control.

Protecting indoor air quality is particularly important in schools, day care centers and other places where children gather because their rapidly growing bodies make them more prone to the adverse impacts of air pollution. Relative

TESTING PRODUCT EMISSIONS

GREENGUARD certification requires that product emissions be measured in stainless steel dynamic environmental chambers ranging from the size of a mid-sized bank safe deposit box to a personal office space, complete with furniture and office equipment. Each chamber maintains a constant temperature, relative humidity and ventilation rate. All emissions from a sample product are measured and analyzed at specific times and analyzed with thermal description gas chromatography/mass spectrometry (TD-GC/MS) or high-performance liquid chromatography (HPLC). For certain products, like electronic equipment, these dynamic environmental chambers can also continuously measure respirable particles and ozone.

To receive **GREENGUARD** certification, products must undergo environmental chamber testing and test results must meet the stringent criteria outlined in **GREENGUARD's** standards. Products must undergo chemical emissions testing on an ongoing basis to demonstrate continued compliance and maintain their certification.

A list of certified products is available on the **GREENGUARD** website at <www.greenguard.org>.

to their body size, children breathe in a greater volume of air – and, therefore, more pollutants – than adults do, resulting in a greater “body burden” for the same amount of exposure. Additionally, compared to adults, children’s heart and metabolism rates are faster, thus enabling more rapid absorption of chemicals into the bloodstream once they are inhaled. EPA studies have shown that improving the indoor air quality in schools can improve concentration, increase productivity and raise student test scores.

School administrators and purchasers are beginning to focus more attention on indoor air quality. The Collaborative for High Performance Schools (CHPS) and the U.S. Green Building Council’s (USGBC’s) Leadership in Energy and Environmental Design (LEED) for Schools require chemical emissions testing based on the California Department of Public Health’s *Standard Method for the Testing and Evaluation of VOC Emissions from Indoor Sources Using Environmental Chambers* (CA 01350). CA 01350 sets emission limits on 35 VOCs with known health effects, but does not address the thousands of other potentially hazardous chemicals used in products today.

GREENGUARD Children and Schools Certification addresses each of the 35 chemicals referenced in CA 01350, setting requirements that are lower than stipulated by the CA test method (with the exception of formaldehyde which is equivalent). The **GREENGUARD Children and Schools Certification Program** also sets stringent limits on hundreds of additional chemicals, including phthalate emissions and establishes a strict limit on total VOC emissions.

BUYING GREENER AND HEALTHIER PRODUCTS

Government purchasers around the world are buying greener products because of legislative mandates, executive policies or concern about the environmental impacts of buying decisions. More and more purchasers are also recognizing that buying decisions have a direct impact on human health, particularly indoor air quality. As a result, purchasers are adjusting specifications to include human health requirements along with environmental and performance requirements.

Office furniture. Purchasers interested in buying more sustainable office furniture are requiring products to meet the Business and Institutional Furniture Manufacturer’s Association (BIFMA) standard. The BIFMA standard covers a variety of environmental impacts including the use of sustainably harvested wood, recycled content and indoor air quality.

As a point-based standard, it is possible for products certified to the BIFMA standard to score well without meeting the most stringent air quality standards. Purchasers concerned about protecting human health are requiring products to meet the **GREENGUARD** standard. The U.S. General Services Administration’s Integrated Workplace Acquisition Center, for example, requires products to meet **GREENGUARD** certification requirements.

Computer equipment. The Federal government and many

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Stainless steel dynamic environmental chambers are used to test products for indoor air emissions. Each chamber maintains a constant temperature, relative humidity and ventilation rate. (Photos courtesy of Air Quality Sciences, Inc.)



state and local governments require computers, monitors and laptop computer products to meet the IEEE 1680 environmental leadership standard for electronics. Computer manufacturers determine which of their products meet the standard and those products are listed on the EPEAT registry.

Given the large number of products on the registry, manufacturers are beginning to seek independent, third-party certifications as a way to provide additional assurance that the products meet the relevant standards. LG Electronics and Lenovo, for example, have more than a dozen products certified by UL Environment to the IEEE 1680 standard.

Recognizing that computer purchasers are concerned about protecting indoor air quality, too, Lenovo has also achieved GREENGUARD Children and Schools Certification for its products. The Lenovo products prove it is possible to meet both a tough environmental leadership standard and the stringent GREENGUARD Children and Schools standard.

Cleaning products. The U.S. Green Building Council's

LEED for Existing Buildings and government purchasers throughout North America require the use of EcoLogo, Green Seal or other certified cleaning products. Green Seal and EcoLogo standards include a variety of human health and environmental requirements, including limits on VOC content. GREENGUARD focuses extensively on protecting indoor air quality through rigorous product testing, measuring actual VOC emissions rather than VOC content. Some products, including those manufactured by Diversey, are now certified by multiple certification organizations such as EcoLogo and GREENGUARD.

Flooring material. A potentially significant source of poor indoor air quality is just under our feet. The materials found in many carpets, including the adhesives used to make them or used to adhere them to the floor, can off-gas VOCs and other chemicals of concern. Similarly the stains, floor finishes and adhesives used for wood, vinyl and tile floors can harm indoor air quality.

Many purchasers buying "greener" carpets are specifying products that meet the NSF-140 environmental leadership standard. It includes a variety of environmental considerations,

including requirements to address indoor air quality. For additional protection of indoor air quality, purchasers are requiring GREENGUARD certification, which is available for a wider variety of flooring materials, including wood floors and tile.

Paint. Government purchasers now routinely require that paints be certified to an environmental leadership standard such as Green Seal or EcoLogo, both of which include VOC content

limits in addition to other environmental and human health requirements. GREENGUARD certification provides an additional level of precaution because its certification is based on the VOC emissions from the product, not just VOC content.

FOCUSING ON HUMAN HEALTH

Buying greener products always means balancing a variety of human health, environmental and social impacts along with traditional price, performance and availability concerns. Many environmental standards focus heavily on the environmental aspects. It is also important to focus on the human health aspects. Remember that every purchase you make affects every breath you take. <

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