

---

## What It Means To Be Green

### Improving Indoor Environmental Quality

Focus: Contaminants from Building Materials

---

Posted in: **Region**  
By Andrew P. Borgese

In the past, the quality of the air within our homes and workplaces has never really been questioned as a major factor that could adversely affect our well-being. In fact, most new buildings were presumed to be essentially free from the dirt and contaminants that we typically think of as polluting our air. But, sometimes it's the things that we do not know, cannot see, or cannot smell, that can harm us.

In this country alone there are 17 million of us who suffer from asthma. There are 40 million Americans with allergies, and millions of days that children and adults are absent from school or work. Americans spend 90% of their time indoors where, according to the US Environmental Protection Agency, pollutant levels may be 2-5 times greater, and in some cases, as much as 100 times greater than outdoor levels. The World Health Organization further supports this finding by reporting that individuals' exposure to air pollutants is primarily due to the inhalation of indoor air. While there are several factors that may contribute to poor indoor environmental quality (IEQ), this article will focus on the role of building materials and their effect on IEQ and more specifically, indoor air quality or IAQ.

Only recently, with the increasing incidence of "sick building syndrome" (SBS) and escalating health problems of building occupants, have we begun to closely reconsider the use of particular building materials. A 1984 World Health Organization report into SBS suggested up to 30% of new and remodeled buildings

worldwide may be linked to symptoms of SBS which are in part, caused by the release, or off-gassing, of chemicals from building materials. We are learning the hard way that identifying and resolving IAQ problems is usually much more costly than preventing them in the first place. By specifying materials that contain, and off-gas, fewer and less harmful chemical compounds, we begin to implement strategies that will improve IAQ. Many typical building products contain high levels of VOCs or, volatile organic compounds. Some examples of these are aldehydes, hydrocarbons, and keytones, plus methane which is a greenhouse gas that contributes to and accelerates the effects of global warming. Other VOCs are benzyne and xylene which are suspected carcinogens. Simply stated, the release of VOCs into the environment contributes to unhealthy IAQ.

By researching and evaluating the particular properties of the carpets, the paints, the adhesives used for wood, rubber, ceramic and vinyl products as well as composite wood products and other building materials, low-, or no-VOC products can be selected that will meet the intended purpose and dramatically reduce or eliminate the harmful off-gassing effects. Unless you have already established a library or directory of such products, making such determinations can be time consuming. Consider, for instance, agrifiber products which are building products derived from recovered agricultural waste (i.e.: cereal straw, sunflower husk, walnut shells, coconut husks) and are processed and mixed with resins to produce materials with characteristics similar to

---

## What It Means To Be Green

### Improving Indoor Environmental Quality

Focus: Contaminants from Building Materials

---

those derived from wood fiber. Any agrifiber product may at first glance seem like a very green and ecologically responsible choice of material, but some of these products contain urea-formaldehyde resins which are used to bind the materials into a finished, usable panel.

Unless an agrifiber product is selected which does not contain any urea-formaldehyde resins, the product will off-gas harmful chemicals and contribute to poor IAQ. Green Seal (<http://www.green seal.org>) and South Coast Air Quality Management District (SCAQMD) are two organizations that have developed standards prescribing VOC limits for adhesives, sealants and primers. These standards have been accepted and incorporated into the LEED building rating system which has already demonstrated successful improvement of IAQ in thousands of buildings nationwide.

As homeowners or individuals concerned about making a healthy and environmentally responsible decision about the materials in your home or workplace, there are some things you can do on your own that require minimal effort. If, for instance, you are considering redecorating a room or work space, there are several choices available locally for low-VOC primers and paints. An even better solution is zero-VOC primer and paint which is also available locally. This zero-VOC paint is becoming the preferred (and in some cases, required) option for use in hospitals, nursing homes, assisted living facilities and offices due to the practically undetectable odor and substantially reduced exposure to harmful chemicals. Occupancy in adjacent spaces is virtually unaffected by painting being done in the renovated areas.

If new carpet is going to be installed, consider a carpet and pad that meets the requirements of the Carpet and Rug Institutes Green Label Plus Program (<http://www.carpet-rug.org>). To receive Green Label Plus certification, carpet and adhesive products must undergo and pass a 14-day testing process that was developed in cooperation with the U.S. Environmental Protection Agency that measures emissions for a range of chemicals and is administered by an independent laboratory. It provides an assurance that carpet and adhesive products meet the most stringent criteria for low chemical emissions. You might also consider alternative flooring options such as cork which is naturally resistant to moisture, rot, and mold, reducing the potential for the growth and spread of airborne allergens. Other benefits from a choice like this are its sound-absorbing and fire resistance properties. It is worth pointing out that the materials used in fabricating and finishing the items you select to furnish the space can have as much of an effect on the IAQ as what is on the wall, the floor and the ceiling so similar steps should be taken in evaluating those products as well.

The health benefits alone ought to be strong enough to support a shift in the way building materials are selected. The ecological and environmental benefits offer a more global incentive to pay serious attention to this issue. For those who continue to resist the growing marketplace shift of going green on the assumption that it is simply too expensive, I offer the following facts from an article in the December 2006 issue of *Barron's* by Charles Lockwood, an environmental and real-estate consultant:

---

## What It Means To Be Green

### Improving Indoor Environmental Quality

Focus: Contaminants from Building Materials

---

- Green buildings have been shown to have **lower annual operating costs** evidenced by an average of 10% savings on utility costs each year. Genzyme's 12-story, 350,000 square foot headquarters in Cambridge, MA uses 42% less energy and 34% less water than a like-sized building of conventional construction.

- Employee **productivity in green workplaces has been shown to increase** by up to 15% annually. According to one economic consulting group a 1% increase in productivity is worth \$3 per square foot per year to a company, or \$600 to \$700 per employee per year.

- The **healthier environments** provided by green offices in Toyota's North American headquarters in Torrance, CA contributed to a **reduction in absenteeism and illness** by 14%.

- The more comfortable and healthier work environment of a LEED certified PNC Financial Services Group building in Pittsburgh showed a **drop in employee turnover** by 50% as compared to other standard PNC facilities.

- Growing evidence suggests that green buildings now **cost no more to construct** than conventional ones. According to a Turner Construction 2005 study, the average cost premium for a basic LEED certified building was 0.8%, which is easily and rapidly repaid through lower operating costs.

- Green buildings **generate significant economic benefits**. According to the McGraw-Hill 2006 SmartMarketReport, they deliver 3.5% higher occupancy rates, 3% higher rent rates, and an average increase of 7.5% in building values; they also improve return on investment by 6.6%, on average. Some green buildings do much better.

Our health, well-being, comfort, and productivity are all linked to the quality of the spaces we build around us. If we want to improve our quality of life, we need to improve the quality of the environment we live in. By becoming more aware and proactive about the materials we use to create these environments, we can begin to make a positive impact on environmental, economic and human health.

*Andrew P. Borgese, AIA, is the Principal of INTEGRÁTA Architecture located at 419 Palmer Ave. in Falmouth. He is also a LEED Accredited Professional and a Licensed Construction Supervisor. For more information, or to contact Mr. Borgese please visit [www.integrata.us](http://www.integrata.us).*

© Copyright 2008 by The Enterprise - Upper Cape Cod News and Information