

## ISSUE FEATURE: INTERIORS

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# Healthy Building Materials And the USGBC Report on PVC

## What You Need to Know for Your Facility

PVC plastic (also known as vinyl) is a widely used—though highly controversial—building material in healthcare settings. Due to concerns about the health impacts of the material, major health systems such as Kaiser Permanente are seeking PVC-free substitutes for new construction. In response, product manufacturers have rolled out a range of new medical products and building materials that advertise their avoidance of PVC. In counterpoint, the Vinyl Institute launched an aggressive advertising campaign to brand PVC as a green material.

Is vinyl green? The heated debate ended up at the U.S. Green Building Council, the nation's largest green building organization. A USGBC task force studied the evidence for over five years.

In February of this year, the task force released its long-awaited assessment of the health and environmental impacts—and the conclusions were not good for PVC. The report makes it clear that PVC is not a healthy building material. According to the report, a proper accounting of the human health impacts of PVC across its lifecycle, including disposal issues and occupational exposure, finds that PVC leads to the release of dangerous quantities of dioxin and other carcinogens. The report authors found that, "When we add end of life with ac-

cidental landfill fires and backyard burning, the additional risk of dioxin emissions puts PVC consistently among the worst materials for human health impacts..."

The healthcare industry first started to pay serious attention to PVC in the mid 1990s when the EPA identified medical waste incinerators as the single largest source of dioxin—the most potent carcinogen known to mankind and associated with a range of other health and reproductive or developmental effects, including birth defects, learning disabilities, endometriosis and infertility. PVC medical products were identified as the primary source of the chlorine-creating dioxin in the incinerators. Being a persistent bioaccumulative toxicant meant that dioxin would not break down rapidly, could travel thousands of miles and would concentrate as it worked up the food chain to humans, creating a global and growing problem. This wake-up call inspired the founding of Health Care Without Harm, which has addressed the problem through encouraging safer non-burn waste treatments and changing medical product formulations away from PVC.

Studies linking phthalates—a chemical commonly added to PVC to make the plastic soft and flexible—to reproductive harm and asthma further increased concern about PVC products. In 2002, the Food and Drug Administration warned healthcare providers to use non-PVC products that do not contain the phthalate DEHP on the most vulnerable patients, including sick infants (ref to [www.fda.gov/cdrh/safety/dehp.html](http://www.fda.gov/cdrh/safety/dehp.html)). In response to the health concerns, more than 100 hospitals or healthcare

## Resources

- The USGBC's report "Assessment of the Technical Basis for a PVC Related Materials Credit for LEED," released in February 2007, can be found on the USGBC's Web site at [www.usgbc.org/DisplayPage.aspx?CMSPageID=1633](http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1633).
- To learn more about PVC, dioxin and other chemicals of concern in building materials, and for further analysis of the USGBC report and industry reactions, visit the Healthy Building Network Web site [www.healthybuilding.net](http://www.healthybuilding.net).
- The Pharos Project has just released a new version of its free, open source material evaluation tool to help the building industry find safe healthy materials. Visit [www.pharosproject.net](http://www.pharosproject.net).
- The Green Guide for Health Care provides guidance on these and other issues in designing healthy spaces for healing, and is the basis for LEED for Healthcare. Download the Guide for free at [www.gghc.org](http://www.gghc.org).
- More about reducing the environmental impact of healthcare buildings and operations can be learned from Health Care Without Harm at [www.noharm.org](http://www.noharm.org).

systems have publicly committed to reduce PVC and phthalates in their facilities, and most of the major group purchasing organizations that buy supplies have committed to reducing PVC in their offerings.

The healthcare demand for PVC-free products, as well as increasing attention to health issues in the growing green building movement, triggered significant shifts in the markets toward safer alternatives within the last five years. Manufacturers have rolled more new PVC-free medical products and building materials, particularly interior finish materials such as carpet backing, resilient flooring, wall protection and window treatments.

Still, however, the USGBC's Leadership in Energy and Environmental Design system of rating the environmental impact of buildings remained silent on the PVC issue. A proposal

to provide a credit in LEED for PVC avoidance in 2000 brought strong criticism from the PVC industry and the special committee was established to investigate and determine if the evidence warranted a credit in LEED.

The USGBC study looked at PVC and several alternative materials in four sample building product types—windows (PVC, aluminum and wood), pipe (PVC, cast iron and ABS), siding (PVC, aluminum and fiber cement) and resilient floor (VCT, sheet vinyl, linoleum and cork)—assessing a range of health and environmental impacts from cancer to smog to climate change.

Evaluating the impact of occupational health exposures and emissions from landfill fires turned out to be key in differentiating this study from previous, more ambiguous, LCA analyses of PVC. The EPA estimates that the 8400 landfill fires reported per year are possibly the single largest human source of dioxin to the environment. With PVC a major cause of dioxin emissions from those fires, the ultimate fate of used PVC products becomes a major liability and was the single largest factor keeping PVC consistently among the worst materials for cancer and health overall.

The impact in other areas was more varied, with different materials rating best and worst in different categories. Because of the environmental impact variability, the USGBC committee report refrained from suggesting an overall environmental credit for PVC avoidance for the LEED system. Instead they recommended issue-based credits, specifically suggesting "comprehensive approaches to issues such as bioaccumulative pollutants" like dioxin. The report now goes to the LEED Steering Committee 2007 to determine next steps.

The report's emphasis on comprehensive approaches and highlighting of bioaccumulative pollutants also reinforces what leading healthcare organizations have been undertaking for several years now, expanding their scope to avoid a broader range of persistent bioaccumulative toxicants that are accumulating in humans. This means not only seeking alternatives to PVC and other chlorinated plastics, but also pushing manufacturers to reformulate or redesign materials to remove heavy metals like lead, mercury and cadmium, halogenated flame retardants and perfluorocarbon based materials.

What does this mean for the medical building designer? The USGBC report clearly validates what many healthcare systems have been asserting in their purchasing and design decisions: that it makes good sense, from a health perspective, to avoid PVC.

More sophisticated tools are necessary to help the designer efficiently navigate the issues. For example, the Healthy Building Network's open source Pharos materials evaluation system are emerging to help the designer make intelligent product selections based on a comprehensive look at the issues, but quickly and effectively. The potential benefits of taking up this challenge are significant. Given the global nature of the toxin problem, the actions taken in each building design stand to benefit not only the system's clients but public health around the world. ■

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