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PVC: Bad for buildings, health, and architects want it out

Experts are looking for alternatives to the highly toxic, widely used material

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BY ALISON RYAN

PVC is everywhere.

It's in flooring. It's in pipes. It's in wall coverings. It's in roofing membranes. It's in window seals.

And as architects work to build healthier buildings, they're trying to push PVC out of the process.

By all accounts, polyvinyl chloride plastic is environmentally ugly. PVC producers are the world's largest users of chlorine gas. About 40 percent, or 16 million tons, of the chlorine consumed per year is used to make PVC. And most of that PVC – about 75 percent – is used in construction materials.

The Cascadia Region Green Building Council's Living Building Challenge, a green building rating effort more stringent than LEED, puts PVC – along with about 15 other toxic materials and chemicals like CFCs and mercury – on a "red list" of materials. Steering clear of the red list is a prerequisite, so projects that use banned materials won't meet Living Building standards.

Those standards are already tough. Initially, said Lisa Petterson of Sera Architects, her firm focused on net-zero energy and water prerequisites for a North Portland housing project the company is designing to meet Living Building Challenge requirements. Now, she said, the team is finding that avoiding the materials red list is just as difficult as getting to net zero.

"It's going to be, I think honestly, one of the most challenging parts of the Living Building Challenge," she said. "Getting the information will be our first challenge."

Putting materials information in the hands of designers is what the Pharos project is trying to do. The under-development Web site, a joint effort among Cascadia, the Healthy Building Network and the University of Tennessee, will offer at-a-glance information on materials makeup. The site also uses an open-source wiki format to let designers share their knowledge of specific materials.

"Everyone knows something about materials, and no one knows everything," Eden Brukman, Cascadia's research director, said. "It's a way to get the community to share."

The site's rating tool, the Pharos "Lens" gives product information in three categories, with different wedges corresponding to different ideas of environmental friendliness.

"It's not only looking at the use aspects of a material, which is what we typically look at, but it's looking at everything from embodied energy to social equity," Brukman said. "And this is a cross-life-cycle tool."

It's also a way, she said, to get manufacturers to offer information about their products.

Manufacturers will eventually be able – after third-party verification – to fill in their own lens.

Materials awareness marks a move down to a more micro level for green standards. At last week's Greenbuild conference, NSF International, a product-testing service, introduced a new standard for assessing the environmental effects of carpet. Products would earn silver, gold or platinum ratings, based on factors like chemical use in manufacturing, energy production and use of recycled content.

Knowing what materials are made of also signals a rising interest in the effects of buildings – and products like PVC – on human health. By-products produced and released during the lifecycle of PVC, according to a Healthy Building Network white paper by Columbia University research scientist Joe Thornton, can cause cancer, endocrine system disruption, birth defects and other health hazards. Pure PVC is rigid. Creating flexible PVC – the kind used in materials



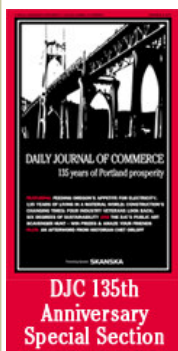
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like floor tiles and wall coverings – means adding plasticizers. The most widespread plasticizers used in PVC are called phthalates, which have been found to cause reproductive system defects.

Most Oregonians are already exposed to phthalates. A recent study of toxic chemical levels in 10 Oregonians found phthalate metabolites in all participants, said Renee

Hackenmiller-Paradis, the environmental health program director at the Oregon Environmental Council, which co-sponsored the study.

“It so permeates our society,” she said.

Buyers are beginning to recognize – and react – to the risks. Kaiser Permanente, for example, has an environmental purchasing policy that promotes PVC-free buildings.

“It’s driving the market,” Hackenmiller-Paradis said, “and making it much more cost-effective to use these materials.”

More cost-effective – but not entirely cost-effective. PVC’s market infiltration is due in large part to the fact that it’s versatile, durable and very inexpensive. Options, even more expensive options, can be hard to find.

Cascadia, Brukman said, recognizes the difficulty. Use of PVC, for example, is allowed for Living Buildings’ code-mandated wiring applications.

“Our intent is not to put out this impossible request,” Brukman said. “What it’s trying to do is push the envelope as far as we can, based on our current limitations of what we know what we can do.”

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