

## Skepticism Greets California Green Building Code

The California Building Standards Commission recently approved CALGreen, the nation's first mandatory statewide green building code (see "Green Goes Mainstream in California," *In the News*, 10/08). Scheduled to take effect on January 1, 2011, the new baseline standard calls for a 20 percent reduction in water use, improvements in energy efficiency and interior air quality, and the diversion of at least 50 percent of construction waste from landfills.

In addition, the new code includes two optional levels — CALGreen Tiers I and II — that can be adopted by jurisdictions wishing to require higher levels of performance. In areas where only the baseline code applies, builders can voluntarily comply with one of these higher tiers and receive certification for doing so from the local building department. Local jurisdictions retain the authority to write their own regulations, provided that the mandatory provisions of the new code are met.

Although environmental groups and certification organizations like the Sierra Club, the U.S. Green Building Council (USGBC), and Build It Green are generally supportive of the baseline requirements, they've expressed skepticism about the optional tiers. "The tiers cause confusion in the marketplace and the potential for builders to label their buildings green without substantiating their claims," says USGBC Northern California Chapter director Elizabeth Echols. She also says that "many local officials who would be responsible for verifying builder claims do not have the technical expertise that LEED and other third-party verifiers provide."

Mainstream builders' organizations, on the other hand — such as the California Building Industry Association — argue that the tiered system will allow builders to meet a certifiable green standard without having to pay for expensive third-party verification. They also claim that many of the mandatory provisions are already part of the statewide building code, so building inspectors should have no trouble performing the necessary field inspections and enforcing the code. — *D.F.*

## How Green Are Low-VOC Paints?

Some people like the smell of fresh paint, while others get headaches from it. The reason? VOCs, or volatile organic compounds, the same group of carbon-based compounds responsible for that "new car" smell. Oil-based paints are loaded with VOCs because they rely on petrochemical-based solvents as carriers for pigments, fillers, and binders. Latex paints use water as a solvent, but rely on VOC-based additives to improve various performance properties. Of course, the VOCs don't remain in the paint; they evaporate into the air — most fairly quickly as the paint dries, but others more slowly as the paint film cures, making it hard for both painters and occupants to avoid exposure.

Many of the VOCs that can be found in a can of paint are harmless; others, like formaldehyde (used as a biocide) and benzene (used to speed up drying), are known irritants and probable carcinogens. Short-term exposure to VOCs can

■ With jobs and credit scarce, some home builders are working directly for lenders, many of whom have been left holding unfinished homes after the original builders went bankrupt, reports *The Wall Street Journal*. The contract work "helps stop the bleeding," said Las Vegas builder Randy Schaefer, who slashed his workforce from 17 to 8 after the housing market tanked in 2007. "It isn't my first choice, but it helps keep me in business." Schaefer is paid a flat fee on the three to four homes a month he has agreed to build for an unfinished subdivision of 170 houses. The arrangement is becoming increasingly common in hard-hit markets like Nevada, Arizona, and California.

■ Hitachi has announced the recall of 65,000 NV83A2 coil framing nailers sold in the U.S. and Canada. A faulty feed mechanism may allow these tools to eject nails sideways, injuring users and bystanders. There have been 37 reported incidents, 15 of which resulted in injuries — most to the face and eyes. The guns subject to this recall were manufactured in Japan between October 2002 and September 2005. For more information, contact Hitachi at 800/706-7337 or go to [hitachipowertools.com](http://hitachipowertools.com).

trigger allergic or asthmatic reactions, while long-term exposure has been linked to respiratory problems, kidney and liver damage, and memory loss.

The main reason VOCs are regulated, though, is that once they escape into the atmosphere, some of them react to sunlight and naturally occurring nitrogen oxides to form ground-level ozone, or smog. Paints and stains account for 9 percent of all VOC emissions in the U.S., second only to cars, according to the EPA.

**A patchwork of regulations.** The EPA first established VOC limits for architectural paints and coatings in 1999. Ever since, paint manufacturers have had to whittle away at VOC levels for both oil-based and latex-based paints to meet federal limits, which currently stand at 250 grams per liter (g/l) for flat paints and 380 g/l for nonflat paints. Today, an average can of flat interior latex paint contains about 150 grams per liter of VOCs, compared with as much as 380 g/l for the glossiest oil-based enamels.

Some states and regional agencies have adopted even tougher standards. For example, the Northeast Ozone Transportation Commission set a VOC limit of 100 g/l for flat paint and 150 g/l for nonflat paint — standards that EPA spokesperson Cathy Milbourn says her agency plans to match. Southern California's Orange County, the smoggiest region in the U.S., has the strictest regulation, with VOC limits of 50 g/l for all coatings. This is also the typical upper VOC limit for most green-building standards, while the accepted level for so-called "no-VOC" paint is currently 5 g/l or less. Today, an average can of flat interior latex paint contains about 150 grams per liter of VOCs, compared with 50 g/l or less for a flat, low-VOC paint.

**Better testing.** But as manufacturers reduce VOC levels in their paints to meet these standards, the EPA's tests are becoming increasingly irrelevant. That's because

■ Six New Jersey women were hospitalized after receiving buttocks-enhancement injections containing nonmedical-grade silicone caulking, reports *The Star-Ledger* of Newark. "It's the same stuff you use to put caulk around the bathtub," a state health official told the newspaper. The women were treated for infections and are recovering, said state epidemiologist Tina Tan, "but there is the potential for more serious complications if these infections are not treated early and properly."

■ Market analysts are looking to 85 million baby boomers now approaching retirement age to boost new-home sales. According to *The Dallas Morning News*, many homeowners entering their 60s are looking to downsize, reduce energy costs, and relocate to be closer to family. This group could account for up to 270,000 house purchases by next year. There's a slight catch, however: To do so, many will have to sell their current homes.

Method 24, their nationally referenced VOC testing procedure, is virtually worthless for testing latex paints with VOC levels below 100 g/l, says Dane Jones, a coatings researcher at California Polytechnic State University in San Luis Obispo. "Method 24 is fairly accurate for solvent-based paints," says Jones, "but with waterborne paints, it's an indirect calculation that actually measures everything but the VOCs." Since the expected margin of error on a 50 g/l paint can be 100 g/l, a paint could actually end up showing negative VOC levels, says Jones.

To measure VOC content in waterborne coatings more accurately, Jones and his colleagues at Cal Poly developed a technique based on gas chromatography, with which compounds in a paint sample can be separated according to their boiling points. This allows a direct analysis of total levels as well as individual levels of specific VOCs. Because of its accuracy, this method — ASTM D 6886 — has been adopted by regulators in California and by some green building standards.

Meanwhile, the EPA is under pressure to modify Method 24 and adopt a direct method such as ASTM D 6886; in fact, says Jones, many paint makers are already

labeling their cans according to results from ASTM D 6886 testing. "A basic gas chromatograph costs about \$25,000," says Jones. "Now, many medium and large-size paint companies have one in their laboratories."

**The color problem.** These days, most paints are tinted at the point of purchase, usually with solvent-based "universal colorants." These pigments can actually double the actual VOC levels of low-VOC paints, which until recently have only been tested in their base colors, before tinting. The EPA acknowledges that this is a problem, but admits that it doesn't have a solution. It's been left to the various regional agencies and authors of green building standards to come up with answers. For example, the Green Seal GS-11 paint standard — referenced by the LEED program — limits colorants to no more than 50 g/l VOC content, and paints tinted at the point of sale to no more than 100 g/l VOC content. How this can be verified is unclear, however.

Some manufacturers have substituted waterborne pigments for universal colorants. According to Mike Mundwiller of Benjamin Moore, the company's waterborne colorants use acrylic pigments that

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can be completely encapsulated by the resins in the paint, adding no VOCs while enhancing the paint's chemical structure. "Solvent-based universal colorants actually detract from paint performance, which is why deep red latex paints, which require a lot of tinting, don't hide well and tend to rub off," he says.

**No-VOC vs. nontoxic.** The EPA concedes that paints that meet its definition of "low-VOC" or even "no-VOC" can actually contain toxic organic compounds and other toxic ingredients. That's because VOCs that aren't photochemically reactive are exempt from EPA regulations; also, the EPA measures total VOCs, not individual levels of specific VOCs. For instance, formaldehyde is one of the few indoor air pollutants that can be readily measured and is the only one that is actually regulated — but not by the EPA. OSHA's permissible exposure level (PEL) for formaldehyde is .75 ppm, while HUD's acceptable exposure level in mobile homes is .40 ppm. If the amounts of ingredients like formaldehyde, ammonia, or crystalline silica are small enough, manufacturers don't have to disclose them to the EPA. For that kind of information, contractors will need to look at material safety data sheets from the manufacturers and rely on third-party certification from organizations like Green Seal ([greenseal.org](http://greenseal.org)), GreenGuard ([greenguard.org](http://greenguard.org)), and Master Painters Institute ([mpi.net](http://mpi.net)). — A.W.