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Foam Insulation Grows Greener

But environmental impacts remain a problem

by Brad Hurley

Manufacturers of the two main types of rigid foam insulation used in the U.S. construction industry have eliminated their use of ozone-eating chlorofluorocarbons (CFCs) ahead of schedule, beating government-mandated deadlines by more than two years. Today, according to Jean Lupinacci of EPA's Global Change Division, all US-made polyisocyanurate and extruded polystyrene foams are CFC-free.

That's the good news. The bad news is that the chemicals used to replace CFCs in foam have their own environmental drawbacks. Although the new blowing agents greatly reduce foam's impact on the ozone layer, they still contribute to ozone depletion and global warming — so much so that EPA wants to phase them out over the next few decades.

Unfortunately, foam makers haven't been able to identify a third-generation CFC replacement that is energy efficient, safe, and economically viable. "I don't know what they're going to do," says Lupinacci. "They may lose a lot of market share if they can't come up with something."

The trouble with HCFCs. Hydrochlorofluorocarbons (HCFCs), a family of compounds related to CFCs, are the alternative currently used by most foam makers. Polyisocyanurate and polyurethane foams (such as R-Max and Thermax) are now blown with HCFC-141b, while extruded polystyrene foams (like Styrofoam and Foamula) use HCFC-142b and HCFC-22. Foam-in-a-can and foam-in-place products generally use HCFC-22, HCFC-142b, or hydrocarbons. Expanded polystyrene (beadboard) is made with pentane, which is safe for the ozone layer but contributes to ground-level air pollution.

HCFCs are easier on the environment than CFCs because they tend to break up in the lower atmosphere, leaving the ozone layer unharmed. But some molecules manage to escape this fate, wafting up to the stratosphere where they release chlorine. Scientists estimate that in the first ten years after being emitted, a pound of HCFC-141b will destroy nearly half as much ozone as a pound of CFC-11. Over 100 years this figure drops to about 10%, but even that represents a significant impact.

Another strike against HCFCs is that they are powerful global warming gases. This is balanced, however, by the high R-value of the insulations, which help prevent global warming: Less fossil fuels burned means less carbon dioxide released.

COURTESY OF CELOTEX CORP.

Makers of foil-faced foam boards and extruded polystyrene have beat the federal timetable for switching from CFCs to HCFCs — cutting their damage to the ozone layer by half.

Due to their role in ozone depletion, the EPA will ban the use of all HCFCs by the year 2030. In addition, the agency has proposed to ban HCFC-141b by 2003, and to place a cap on the production of HCFC-142b and HCFC-22 in 2010.

continued

Of Mice and Carpets

Almost a year ago, the carpet industry was put on the defensive by media reports of a study in which mice developed health problems after being exposed to emissions from carpet samples that had been sources of homeowner complaints (see "Carpet and Indoor Air Quality," *JLC*, 4/93). Anderson Laboratories of Dedham, Mass., conducted the original study, and the results were dramatic enough — several mice died and others developed neurological and respiratory disorders — to trigger congressional hearings, an EPA investigation, industry-funded research, and several lawsuits.

Since then, additional tests have been conducted by Anderson Labs, by the EPA (both at Anderson Labs and at an independent testing site), and by researchers at the University of Pittsburgh. The latter were commissioned by the Carpet and Rug Institute (CRI), a trade association. While the results of the various research efforts were mixed, the EPA testified at a Senate Committee hearing this past June that it "does not believe that failure to replicate the Anderson Laboratories' findings proves carpet emissions do not pose any adverse effects."

According to Mark Goldman, General Manager of Anderson Labs, inconsistencies in test results are due to differences in procedure. He says more information on which chemicals are causing the mice deaths will be coming out over the next six months, but the problem "appears to be linked to the SBR latex backing." SBR (styrene butadiene rubber) is applied to over 90% of the carpets produced in the U.S.

Several lawsuits around the country, including a federal class action, blame carpets for adverse health effects. Recently, Attorneys General in four states (New York, Vermont, Oregon, and Connecticut) called for CRI to rescind its "Green Tag" Program, in use since 1992, because they say it is misleading. When attached to new carpet, CRI's green tag indicates only that the carpet meets *industry standards* for VOC emissions. The EPA agrees that "consumers may be erroneously interpreting the 'green tag' as an indication of product safety." The EPA, with the Consumer Product Safety Commission, plans to conduct consumer focus groups to see if this is the case.

Although Ron Van Gelderen, president of CRI, believes the Anderson research is "seriously flawed," he says the industry wants to "do what's right." Van Gelderen agrees that the green tag seems to have been misinterpreted by consumers. A new tag, to be displayed on all carpets and at every carpet store, will describe the risks new carpeting poses to chemically sensitive individuals.

— *Kathleen O'Brien*

Installed Sales: Friend or Foe?

As Sears slowly pulls out of the business of installing the products they sell, including siding and kitchen cabinets, one home center chain is aggressively trying to fill the void. HomeBase, a Fullerton, Calif., home center chain, with 88 location in 13 states, has taken on several former Sears installer/contractors and is expanding its installed sales program. "The difference will be our range of project," says HomeBase spokesperson, including room additions, kitchen and bath remodeling, and landscaping, offering a larger scale of work than typical installed sales programs through suppliers and home centers.

The program is not a referral service. Once an in-home estimate is conducted by a HomeBase salesperson, and the contract is signed, the company sends out a contractor to do the work. The contractor is paid by HomeBase, not the homeowner, allowing the company to warrant the work and products installed. The company already has hired more than 120 ex-Sears contractors and isn't looking for any more. "If we need you, we'll find you," says the HomeBase spokesperson.

Though the company won't comment on the margins contractors may make on the deal, the program does offer a steady stream of work, incentive enough for some contractors to inquire about joining up. "It's an emerging trend," says Alan Campbell, executive vice president of the National Association of the Remodeling Industry (NARI). "In some cases, it's welcomed into the market by the local contractors." A chain like HomeBase may not only offer jobs, but help expand the NARI membership base and offer financial resources. But, says Campbell, installed sales can also be viewed as competition in markets already struggling. "Every contractor is a competitor," he says. "It depends on the type of work being offered by the installed sales program." □

Foam Insulation, continued

No easy solutions. Foam makers have already begun looking for new blowing agents to replace HCFCs. "We're going to leave no stone unturned," says Jared Blum of the Polyisocyanurate Insulation Manufacturers Association. The industry is currently evaluating hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), both of which are ozone-safe, as potential substitutes. But the EPA's Lupinacci notes that HFCs don't insulate as well as the gases currently used, they're more expensive, and some are flammable. And the government intends to restrict the use of PFCs, which are the strongest global warming gases known to science. Hydrocarbons are another option, but they have flammability, thermal conductivity, and air quality problems.

Joe Creazzo, a technical service engineer with Du Pont, contends that HFCs are a good solution. Economies of scale will eventually bring down the price, and R-values can be improved, he says. "There are things you can do with the foam, like changing cell structure or density, that can help you optimize insulation value," he notes.

What's a builder to do? For builders who must use foam, there are ways to at least minimize risk to the environment. Expanded polystyrene is one option, and there are even a few ozone-safe foams on the market that don't cause any air pollution — such as *Supergreen* foam-in-place polyurethane, which uses HFC-134a. (Supergreen is distributed by Foam-Tech, P.O. Box 87, N. Thetford, VT 05054; 802/333-4333.) According to Creazzo, products manufactured with HCFC-22 or HCFC-142b are only half as damaging as those made with HCFC-141b and yet still achieve "comparable" R-values. And some polyurethane makers may begin diluting HCFC-141b with HCFC-22, decreasing the ozone risk while increasing R-value.

With CFCs out of the picture, foam is much kinder to the environment than it used to be. The negative impact of its modest contribution to ozone depletion is balanced by its high R-value, which helps prevent global warming.

But for now, the fact remains that most foams still harm the ozone layer. "Foam doesn't have a huge impact by itself," says Kevin Gurney, a scientist with the Institute for Energy and Environmental Research in Takoma Park, Md. "But when you add up the emissions from all the different sectors that use HCFCs, it becomes serious. This is a problem that is the sum of many little parts."

In the July/August 1992 issue of *Environmental Building News*, Alex Wilson recommends that builders avoid ozone damage by using rigid fiberglass, high-density expanded polystyrene, and thick installations of fiber materials such as cellulose or fiberglass. "Our challenge," he wrote, "is to do so without sacrificing energy efficiency. ☐

Brad Hurley is editor of the newsletter Global Environmental Change Report, published by Cutter Information Corp. in Arlington, Mass.

From What We Gather

Beware of radiant barrier installers certified by the National Energy Specialist Assoc. (NESA). The Federal Trade Commission found that the self-styled trade organization, based in Topeka, Kan., ran a bogus certification program (they certified anyone who paid a fee), made false claims about the energy performance of members' products, and offered empty warranties of energy savings to consumers who had NESA-certified products installed. When NESA failed to respond to the FTC charge, a federal district court fined the organization $1.44 million.

Kids love to watch construction equipment, right? That's what Fred Levine, of Montpelier, Vt., realized when he saw his two young sons glued to the screen watching a bulldozer on Sesame Street. So Levine thought, why not make a video of the sights and sounds of big construction equipment for very young kids? Next, he spent a year shooting footage of every phase of construction of new highway in R.I., — drilling, blasting, dumping, etc. — and added simple narration and upbeat music. In less than one year, with publicity from newspaper stories, radio spots, and a few well-placed ads, he has sold 70,000 cassettes at $23.90 each for a total of $1.7 million. Home building videos, anyone?

The vast majority (84%) of older Americans want to stay in their homes and never move, according to a recent survey by the American Assoc. of Retired Persons (AARP). The desire to age in place means work for remodelers. The most common home modifications reported in the survey were added lighting (23%), single-floor living (18%), replacing knobs with levers (18%), and adding handrails or grab bars (17%). Related services identified as "somewhat or very useful" were light home repair (40%), and outdoor maintenance (49%). ☐

Drywall on the Cob, Anyone?

It may sound corny, but when researchers spread pulverized drywall scraps on this field, they reaped a 25% increase in the corn harvest.

Future farmers may spread ground-up drywall scraps on their fields of corn and other crops, according to Mark Burger, a graduate student at SUNY College of Environmental Science and Forestry in Syracuse, N.Y. Burger's experiments have demonstrated that pulverized drywall has a beneficial effect on the mineral content of soil, similar to the effect of spreading lime.

For years, farmers have added pure gypsum (*calcium sulfate*) to soil to stabilize pH and improve fertility. In October 1990, Burger set out to discover if the gypsum in drywall would provide the same benefits without harmful side effects. He selected a half-acre section of cornfield in Tully, N.Y., leaving some sections untreated as controls, and spreading the others with either limestone, pure gypsum, or pulverized drywall. Burger used only new drywall cutoffs and damaged pieces, ground into a fine powder, paper and all.

In September 1991, after the soil was tilled and planted, Burger found that corn yield increased 25% in soil plots that had received the pulverized drywall, just as it did in plots treated with limestone and pure gypsum. The pulverized drywall added several beneficial minerals to both the soil and the corn. Heavy metal content and soil pH were unaffected.

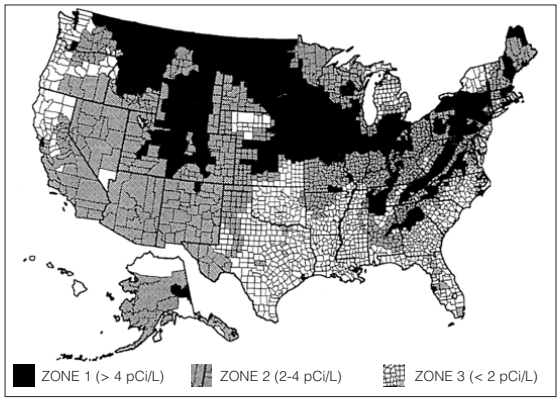
Burger hopes to find funding to study the long-term effects of drywall on soil and to experiment with larger drywall particles. He's hopeful his results will convince regulatory agencies to permit widespread use of the technique. Burger cautions against spreading demolition drywall, however, because of possible toxins in the paint.

Manufacturers also discourage the practice with moisture resistant and fire-code drywall, both of which contain compounds that may not break down as readily as gypsum. Many landfills have stopped accepting drywall waste because of the noxious hydrogen sulfide gas it gives off when mixed with other types of solid waste. ☐

Radon Researchers Seek Builders

The U.S. Environmental Protection Agency (EPA) is trying to figure out practical ways to build radon-resistant homes. To accomplish that, they are looking for builders in high-radon areas (the black areas in the map below) to participate in a field study. Participating builders will get technical support in building homes using the most up-to-date radon-resistant techniques and will get free radon testing once the homes are completed. Qualified radon testers will conduct both short-term and long-term tests over a period of two years.

Energy Conservation Management Inc., which is overseeing the program for EPA, is looking for builders in high-radon areas and for qualified testers. For more information, contact Tara Dorr at ECM, 519 N. Charles St., Baltimore, MD 21201; 410/576-0644. ☐



EPA's preliminary map of radon zones by county.

What to Keep, What to Toss

If your files are overflowing but you're afraid to toss any of your records for fear the Internal Revenue Service will audit you, Gerald T. Reilly and Company, Certified Public Accountants in Milton, Mass., recommend you use the following schedule:

- As a rule, the IRS can contact you for up to six years after a return is filed. But to keep yourself covered, retain general and private ledgers, legal correspondence, mortgages and tax returns indefinitely.
- Bank reconciliations are seldom needed during an audit. Keep these for one year.
- Expired contracts and leases should be kept for seven years. ☐

Court Extends Limit on FRT Plywood Claims

Both builders and homeowners claimed victory when a New Jersey appeals court recently ruled in their favor on claims associated with fire-retardant treated (FRT) plywood. The decision concerned a 1991 state law that established a multi-million dollar fund to compensate homeowners with FRT roof failures — as well as builders and warranty companies that honor the claims of owners.

The court's ruling overturned a 1992 regulation issued by the state's Dept. of Community Affairs (DCA) that limited compensation to roofs that actually failed during a ten-year period. Owners of roofs that only showed signs of future failure were left with no recourse but to seek other means of compensation, which led to lawsuits against builders, suppliers, treaters, and warrantors.

A group of builders and condo associations filed an appeal in 1992 to the state appellate court. "We challenged the regulations on grounds that the legislature said you only had to show that there would be a premature failure compared to the normal life of the roof," says Peter Buchsbaum, the Woodbridge, N.J., attorney who represented the plaintiffs. The three-judge panel agreed that the DCA's strict ten-year limit was "contrary to the intent of the legislature." The court also ordered the DCA to develop testing procedures for predicting premature failure by the end of the year.

Builders are particularly pleased with the decision because it limits their liability for FRT-related problems to the two years after the roof was installed. After that, according to Buchsbaum, they're "off the hook," and the state fund takes over. The plaintiffs' lawyers estimate that the decision will affect about 10,000 housing units. The state fund currently contains $55 million, and claims average about $2,000 each. □

Firestopping Pulled From Market

Dow Corning has withdrawn its intumescent firestopping product *Wrap Strip 2002* from the market. The product, which was introduced in 1987, was wrapped around pipe penetrations in commercial buildings. An intumescent material is one that expands to fill a void. In this case the expansion was to be triggered by a fire — but the company withdrew the product after tests raised questions about its ability to perform predictably over time. Dow's other firestopping materials are not affected.

Although there have been no injuries or loss of property due to the product, Dow is asking anyone who knows where it may have been installed to contact them. Test results are available from Dow Corning, and technical assistance will be provided to building owners who need to remove the material.

All inquiries and information should be directed to David M. Horshig, Dow Corning Corporation, Mail Stop C02310FS, P.O. Box 994, Midland, MI 48686; 800/772-9727. The product was also sold under a private label agreement with Hilti Construction Chemicals Inc. as *CS 2420*. Hilti has also discontinued sales and is attempting to contact its customers. □

TAX TALK

Rehab Tax Credits

by Milton Zall

A 10% tax credit is available for those who rehabilitate buildings constructed prior to 1936. One of the requirements for qualifying for this credit is that at least 75% of the existing external walls of the building be "retained in place" as walls.

One IRS regulation interprets this requirement to mean that the building must not be moved. A case brought before the Tax Court recently tested the correctness of this interpretation. The case in point involved George Nalle, who rehabilitated eight structures in Austin, Texas. The buildings were purchased and moved to the suburbs, where they were restored.

The IRS said that although 75% of the existing exterior walls were retained, the buildings were not retained in place because the buildings had been moved. Nalle said, the phrase "retained in place" required that 75% of the existing walls be retained as external walls after the building was rehabilitated but not that the building had to remain where it was.

The Tax Court sided with the IRS, explaining that it was the Court's belief that Congress' intent in providing the rehab credit was to provide a financial incentive for existing businesses to improve their facilities and plants in older locations and not abandon these facilities.

The Fifth Circuit Court of Appeals saw it in a different light. The Circuit Court said that, while it was true that buildings targeted for the rehab credit were primarily located in central cities in old neighborhoods, there's nothing in the statute or the legislative history of the rehab credit to suggest that the credit is limited to buildings that are in central cities or older neighborhoods.

The bottom line: Moving an old structure and rehabilitating it doesn't disqualify the owner from claiming the 10% tax credit. □

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