

Code Red

New energy codes turn up the heat for walls packed thick with combustible insulation



Lighten Up: National Gypsum developed 5/8-inch-thick wallboards that slow the spread of fire while weighing 15% less than standard Type X (fire-resistant) gypsum.

The wall construction discussion is about to get hot. For the first time, the International Energy Conservation Code (IECC) requires an exterior layer of continuous insulation in cool climate zones and more airtight, densely insulated walls in the rest. But as 2012 IECC-compliant builders pack walls with highly efficient yet highly combustible products, they will face fast-evolving fire codes, tests, and standards.

“Code officials and manufacturers are being asked questions they haven’t been asked before,” says Robert Palardy, manager of technology at LP Corp. “Such as, ‘How does the addition of a foam-based insulation board affect the fire resistance of the wall assembly I’ve been using for the past five years?’”

The answer? It varies; a complication added to the already complex task of building energy-efficient homes.

The Department of Energy predicts homes built to the 2012 IECC will save 30% more energy than homes built to

the 2006 standard. To reach this mark, homes constructed in zones 6, 7, and 8 must have an exterior layer of rigid foam insulation, or a comparable continuous insulation strategy, to reduce thermal bridging. Not only will higher R-values and tougher air exchange numbers demand that builders install walls good and tight, they will have to prove it: Blower door tests are now mandatory. And while not new, the National Fire Protection Association’s “standard fire test method for evaluation of fire propagation characteristics of exterior non-load-bearing wall assemblies containing combustible components” (NFPA 285) will put pressure on manufacturers to ensure that flammable foam-plastic insulating sheathing will not compromise the fire rating of type I, II, III, or IV structures.

“Foam is a plastic. Plastics burn,” says Michael Sites, marketing manager for Convenience Products, “so we put special fire retardants in our spray foam.” But even products that pass the NFPA’s strict test hold grim warnings. The material safety data sheets (MSDS) of some of the top rigid foam products caution their materials may form explosive dust in an enclosed atmosphere during fabrication or emit pentane vapors when heated that may ignite with an electrostatic discharge, spread flames rapidly, and possibly explode.

A June 2011 report by the Foam Sheathing Coalition lists a number of foam insulation products that pass NFPA 285, including Owens Corning’s Foamular 150, 250, 400, 600, and 1000 extruded polystyrene (XPS) insulation boards (*circle 150*); and Dow’s Thermax (*circle 151*) and Styrofoam (*circle 152*) insulation boards. Atlas EPS also makes a variety of products, including Falcon Foam (*circle 153*), ThermalStar (*circle 154*), and Elevation (*circle 155*) expanded polystyrene (EPS) insulation boards; X-Grade TalonGuard EPS (*circle 156*); Staccato EIFS (*circle 157*); T & G Board (*circle 158*); and ThermalStar D2D (*circle 159*).

Maryland is currently the only state enforcing the 2012 IECC, and 25 states haven’t even adopted the 2009 IECC. But manufacturers are already developing, testing, and refining products to address challenges well before regions reach the next level. In March, for instance, Dow Global Technologies developed a high molecular weight brominated polymeric flame retardant it believes will be the next industry standard flame retardant for XPS and EPS foam insulation products.

Bridging the Gap At Fomo Products and Convenience Products, business is booming for spray polyurethane foams (SPF). However, a thermal barrier, such as 1/2-

Product Monitor **Fire Retardants**



Firefighters: USG's new fire-retardant wallboards are lighter than standard Type X gypsum.

inch gypsum board, must cover SPF applications to keep flames from reaching the combustible product in less than 15 minutes, allowing occupants to escape before a potential flashover or explosion. In service-only spaces, an ignition barrier like particle board, gypsum, or corrosion-resistant steel has to protect the foam, adding another step and cost. To simplify the process, both companies developed a fire-retardant coating to fulfill an exception in the code.

"It's a lot easier to apply an intumescent coating, which

is exactly like paint, than ignition barriers made from particle board, drywall, or mineral wool," says Sandra Gump, product compliance manager for Fomo. The code allows exceptions like Fomo's Handi-Foam Ignition Barrier (*circle 160*) if they pass the International Code Council's (ICC) test protocol and cover SPF sprayed exclusively in service-only attics and crawl spaces that aren't used for storage, Gump says. The company's latex-based barrier reacts with fire by forming a layer of carbon that removes the flames' fuel and prevents stray sparks from catching.

Convenience Products' Touch 'n Seal Ignition Barrier Coating (*circle 161*) is also a latex-based intumescent coating that covers the SPF with a char-barrier to protect it from flames. The ignition barrier can be sprayed, painted, or rolled on, Sites says.

Last year, Gaco Western fused its foam with ignition barrier technology to create GacoFireStop (*circle 162*), an open-cell foam that applies like other spray foams but with the ignition barrier built in. It was the first open-cell foam to pass the ICC's test criteria for attic and crawl spaces (ICC-ES AC 377 Appendix X) and costs less than competitive open-cell foams with separate ignition barrier coatings, the company claims.



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But like rigid foam insulation, the fire ratings of spray foam can vary widely.

"The composition of all spray foam products is similar, but they are going to meet different things—that might create some confusion," Gump says. "There is lots of code development and test protocols being [written] right now, so that is going to shake it up a bit, too."

On Board Foam-based insulation is not the only product feeling the heat of stricter energy requirements.

The 2012 IECC has spurred interest in deep energy retrofits, says LP's Palardy, but bringing a 50- or 100-year-old home up to current code creates a new challenge.

If the home sits within 5 feet of the lot line, the walls need to last an hour in a standard fire test, and with the seismic and wind load requirements of some areas, old walls get thick quick with the added layers of insulation, fire-retardants, and structural panels.

"In these urban settings, it's surprising to me how often an architect finds value in a wall that is 5/8- or 1/2-inch narrower as a result of using a product that frees up a little space in the home," Palardy says. "That's a trend that is providing demand for products like FlameBlock Fire-Rated OSB Sheathing."

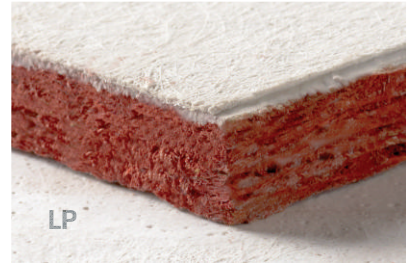
LP's FlameBlock (circle 163) sports a fire-resistant coating designed by International Barrier Technology to

give the sheathing a Class A flame spread rating and 20-minute thermal barrier protection. Flameblock reduces labor, wall thickness, and often the number of inspections required, Palardy says.

While not any thinner, USG Corp. and National Gypsum developed 5/8-thick fire-retardant wallboards that are 15% lighter than standard Type X (fire-resistant) gypsum. Easier to score, snap, and install, the Sheetrock Brand UltraLight Panels Firecode X (circle 164) are listed for use in more than 130 UL fire-rated assemblies, and the Gold Bond High Strength Fire-Shield Lite Gypsum Boards (circle 165) use noncombustible fibers to keep the core from collapsing in extreme heat.

According to the U.S. Fire Administration, roughly 374,900 residential building fires are reported annually, causing 2,630 deaths, 13,075 injuries, and \$7.6 billion in property loss. To keep these numbers down, code bodies are continually raising the standards to keep up with new building practices.

And according to Palardy, this is just the beginning. "All of us will have to adapt our products to energy changes while meeting fire requirements," he says.—*Evelyn Rabil*



Beat the Heat: LP's FlameBlock uses a fire-resistant coating to keep flames from spreading.

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