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GREEN BUILDING: Structural insulated panels offer advantages

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Using structural insulated panels, or SIPS, to build your home can create a more energy-efficient and healthy home.

SIPS, an engineered product, are composed of foam insulation sandwiched between a “skin” of oriented strand board, or OSB. Together, the foam and wood create a strong wall section that provides a continuous layer of insulation and an air tight building envelope. Sometimes called stress skin or foam core panels, SIPS act as both structure and insulation and can be used for both the walls and the roof system of your home. The layer of OSB on the two sides also provides a continuous nailing surface for drywall and siding.

There are two different types of foam insulation that are used between the wood, the most popular and least expensive is extruded polystyrene, or EPS. You may know it as bead board or by the brand name Styrofoam. Insulation is measured by its R-value, or ability to provide resistance to heat movement. EPS has an R-value of about 3.5 per inch, and the OSB is glued to the foam. Polyurethane foam SIPS have insulating foam that is injected into a mold, adhering the OSB to the foam. The foam hardens and has an R-value of about 7 per inch. Although this diminishes slightly over time, polyurethane panels are better insulators.

Structural insulated panels are more energy-efficient than conventional two-by-four framing. When a wall is conventionally framed, the fiberglass insulation is placed between the two-by-four skeleton. This creates breaks in the insulation envelope, the thermal barrier separating you from the outdoors. SIPS seldom have thermal breaks of solid wood. Don't forget, the higher the R-value, the lower your heating and cooling bills.

Energy efficiency is not just higher R-value. Uninvited air coming into your home can also increase the cost of home operation. On average, a new American home loses a third of its conditioned air to cracks and holes in the building envelope. Building scientists have determined that it is best to build a tight house with a ventilation system that you control. Structural insulated panels create a very airtight wall system. No air can get through the panel, and proper installation ensures that the entire wall or roof system is airtight.

A tight building envelope and increased insulation help make the home a healthier place as well. Air infiltration can bring in moisture, which can lead to mold. Improper insulation can cause cold spots, which can condense the moist air in the home, also leading to mold. Knowing where your air comes from ensures that it is not coming from the basement or crawlspace, outside or the dirty attic.

A structural panel home can cost more to build, but savings in saved time and fewer weather delays can offset the initial cost. Inevitably, however, a structural panel home will cost less to own and operate, and keep in mind that you are getting a better product. And builders: As of Jan. 1, you can get a \$2,000 tax credit for building a superenergy-efficient home.

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