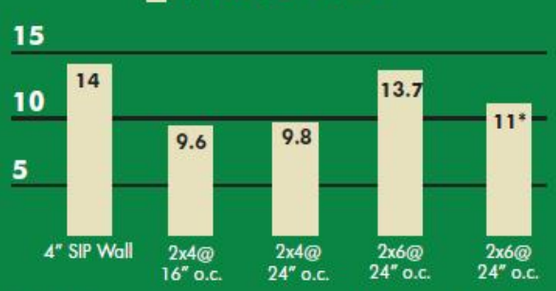
SIP Walls are Engineered to Minimize Thermal Bridging

A SIP wall has little wood framing and provides solid, continuous insulation that will not compress over time.

What are Structural Insulated Panels?

The basic definition of a structural insulated panel is "A structural sandwich panel which consists of a foam plastic insulation core securely bonded between two structural facings (such as oriented strand board)." Other structural facings can be used for specific applications. The foam core in a SIP performs a structural, insulating and air-sealing function in wall, roof, floor and foundation systems.

WHOLE WALL R-VALUE COMPARISON



This chart shows a realistic comparison between SIP wall and stud wall thermal performance. Superior design enables even a 4-inch SIP wall to outperform the fatter 2x6 stud wall, despite the stud wall's nominally higher rated insulation. The 4-inch SIP wall beats the 2x4 stud wall by R-4, providing 40% more thermal resistance.

Source: Jan Kosny, Andre Desjarats, and Jeff Christian, ORNL
From Figure 9, Whole Wall Rating/Label for Structural Insulated Panel Steady-State Thermal Analysis, June 4, 1999

*Test shows that in the "worst case commonly found of procedures for installing batt insulation" the performance drops to R-11. This is a result of common installation imperfections such as "rounded shoulders, 2% cavity voids, compression around wiring, and paper facers stapled to the inside of studs."

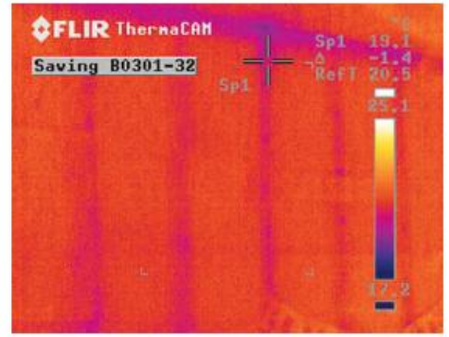
From Table 4, How Imperfections Affect the Whole Wall R-value of 2 x 6 Batt-Insulated Wall. ORNL.

SIPs Conserve Energy

The foam insulation used in SIPs is extremely effective because it is solid and consistent throughout the home. In addition, SIPs are made in large sections, up to 8'x24', meaning there are fewer gaps and heat or cooling loss due to air infiltration.

SIP homes have repeatedly demonstrated annual energy savings of 50-60% when combined with other high performance systems. SIP test homes monitored by the Department of Energy's Oak Ridge National Laboratory had heating and cooling costs as low as 45 cents per day.

Home energy use has a sizable impact on the environment. Homes account for 15% of energy use nationwide, and release on average 22,000 lbs of CO_2 into the atmosphere annually, roughly twice as much as the average car. Building a SIP home that uses half the energy will be the same as removing one car from America's highways.



Thermal imaging of wood-framed wall shows heat escaping through studs.

Photo courtesy of Thermapan Structural Insulated Panels.

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Form No. L-208

SIPA
Structural Insulated Panel Association

SCIENCE + ENGINEERING

= lower energy bills + comfort + improved indoor air quality + "green" building benefits + disaster resistance + higher assessed home value

= SIPs

SIPs Conserve Resources

The insulating foam cores used in SIPs are made of 98% air, and require only a small amount of petroleum byproduct to produce. All SIP foam core materials are made using non-CFC blowing agents.

The OSB used in SIPs is an engineered wood product made from small trees that can be sustainably harvested. Engineered wood products use wood more efficiently than sawn lumber and it requires significantly less lumber to build a SIP home than a conventional wood frame house.

Jobsite waste is almost eliminated when building with SIPs because the majority of fabrication takes place in the SIP manufacturing plant. Clean waste generated in the plant can be recycled to make other foam products.

Healthy Indoor Environment

Recent studies indicate that the indoor air quality (IAQ) in homes can have significant effects on respiratory illness, particularly childhood asthma. The degree of tightness capable in a SIP home allows greater control over IAQ by limiting incoming air to mechanical ventilation systems that can filter air for allergens or remove humidity.

The inside of a SIP panel is solid, continuous insulation, absent of cavity voids often prone to mold growth in wood frame houses. Mold growth can also lead to serious respiratory problems and allergic reactions.

Economics of Energy Efficiency

Owners concerned with the "payback" on a SIP home often find that the utility savings of a SIP home are so great they surpass any incremental mortgage payments.

SIP homes qualify for many Energy Efficient Mortgages (EEMs) that allow income-to-loan ratios to be stretched if an energy-efficient home is purchased. In addition, SIP homes have a higher appraised value, as much as $25 or more for every dollar of annual energy savings.

Durability and Safety

Structural insulated panels function like a steel I-beam. This web and flange design delivers engineered structural performance. Resistance to air infiltration and moisture intrusion increases the life of a home, and building longevity is a key component in environmentally sustainable building.

SIP homes have withstood hurricane winds and earthquakes with amazing integrity owing to superior transverse load resistance. The solid construction of SIPs makes a SIP home safer and more comfortable for your family.

SIPs Save Time and Labor

A recent R.S. Means study shows building with SIPs can save 41% on labor and up to 55% on time (BASF Corporation Time and Motion Study, R.S. Means, 2006). That's because SIPs arrive at the construction site ready to set in place with speed and precision and there is no need to install sheathing or insulation.

Experience the Benefits of a "Green" Home with Structural Insulated Panels

Where Can I Find a SIP Home?

To find a SIP manufacturer, dealer/distributor, builder, design professional or remodeler who is a member of the Structural Insulated Panel Association, search our member database at www.sips.org.

Modern science and engineering have drastically changed our lifestyles in the last hundred years. Advanced emerging building materials, such as structural insulated panels, are engineered to provide more durable, energy-efficient homes with less impact on the environment.