Not All Homes are Created Equal . . .

Some are High Performance

EPS BUILDINGS

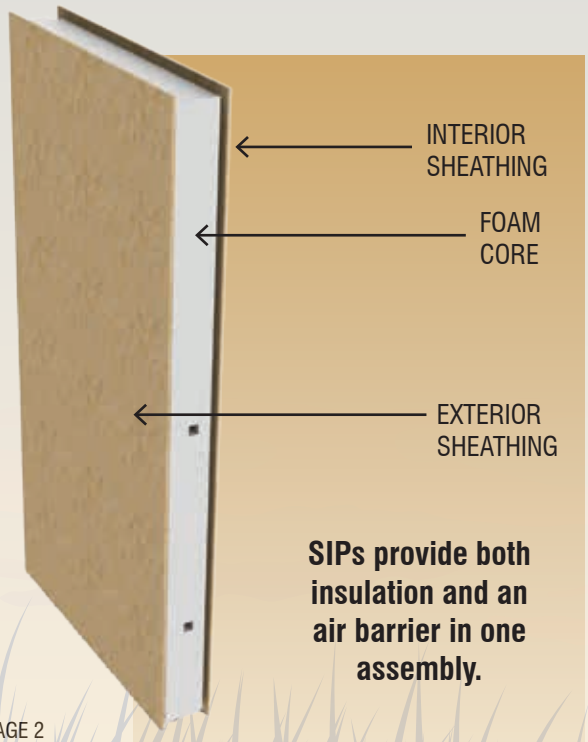
Building With EPS Structural Insulated Panels (SIPs)

Structural insulated panels are high-performance building panels used in exterior walls, roofs, and floors. The panels are made by sandwiching a core of rigid foam insulation between two skins of oriented strand board (OSB).

SIPs Save Energy
Building with SIPs creates a superior building envelope with high thermal resistance and minimal air infiltration.

SIPs Save Money
SIPs are one of the most airtight and well insulated building systems available, making them an inherently green product. An airtight SIP building will use less energy to heat and cool, allow for better control over indoor environmental conditions, and reduce construction waste.

SIPs Save Time and Labor
SIPs are ready to install when they arrive at the job site, eliminating the need to perform individual operations of framing, sheathing, and insulating stick-framed walls. This saves builders a significant amount of on-site labor.



SIPs provide both insulation and an air barrier in one assembly.

South Carolina ENERGY STAR certified home with a HERS rating of 46.

SIPs Save Resources
The major components of SIPs, foam and OSB, take less energy and raw materials to produce than other structural building systems. SIPs are also fabricated in a controlled environment, allowing for greater efficiency than site-built framing.

OSB is manufactured from fast growing, underutilized, and often less expensive wood species grown in carefully managed forests. The OSB production process uses small wood chips and highly automated machinery, making OSB a very efficient use of raw materials.

Expanded polystyrene is a lightweight closed cell insulation. Over the lifetime of a house, the expanded polystyrene insulation used in SIPs will save many times the energy embodied in the petroleum used to make it. It takes 24% less energy to produce expanded polystyrene than fiberglass insulation of equivalent R-value.*

*http:/www.epsmolders.org/5.html

Choosing EPS

Energy Panel Structures, Inc. has been in the business of manufacturing cost-effective pre-engineered buildings and SIP systems for over 35 years.

EPS was established in 1981 and is an employee-owned division of the MacArthur Company in St. Paul, MN (founded in 1913). MacArthur is a 100-year old employee-owned company with over $375 million in annual sales throughout the United States.

Home buying is complex enough without having to know all of the details of energy efficient construction. Instead, you can work with our EPS network of more than 350 independent authorized dealers to build the house of your dreams and enjoy peace of mind knowing that your EPS SIP home has proper engineering and manufacturing from the start.

Building with EPS Structural Insulated Panels creates a solution that benefits the environment and your wallet.

■ A 2,500 square-foot home built to ENERGY STAR specifications is designed to save the homeowner anywhere from $600 to upwards of $1,500 on annual utility bills. These numbers are comparisons to industry-standard averages for new home construction and due in large part to significantly less energy and water consumption.

EPS can help you find rebates from local utility companies for energy efficient construction. You may qualify for up to $3,000 on your next home*.

*Consult your local energy companies for regional rebates.

Whether it's a national rebate or an ENERGY STAR rating, we can help you obtain maximum rebates and investment certificates.

EPS designs, engineers and manufactures the trusses for just about any type of home design.

Benefits Of ENERGY STAR®

A New ENERGY STAR Certified Home Delivers:

- Better indoor air quality
- More comfortable
- Reduced drafts
- And may qualify for local and national credits and rebates
- Requires less maintenance
- Has overall higher quality

To earn the ENERGY STAR, a home must meet guidelines for energy efficiency set by the U.S. Environmental Protection Agency. ENERGY STAR certified homes can include a variety of energy-efficient features that contribute to improved home quality and homeowner comfort, and to lower energy demand and reduced air pollution. At the top of the list is *effective insulation*. SIPs provide effective insulation for the house envelope to ensure even temperatures throughout the house, reducing energy use and increasing comfort. **SIPs provide effective insulation by providing both insulation and an air barrier in one assembly.**

LEARN MORE AT energystar.gov

NAHB NATIONAL GREEN BUILDING PROGRAM™

Benefits of SIP Construction

Enhanced Comfort
Properly installed insulation, like that in SIPs, minimizes temperature variability indoors and helps keep rooms warmer in the winter and cooler in the summer.

Lower Utility Bills
As much as half of the energy used in your home goes to heating and cooling. By preventing heat loss in the winter and heat gain in the summer, SIPs reduce utility bills year round.

Improved Durability
With SIPs, the potential for condensation that can lead to decay of building materials is reduced, helping to improve the durability of your home. SIPs come with the insulation already properly installed, reducing the potential for human error during installation.

Better Resale Position
The improved comfort, lower utility bills, and improved durability of a SIP home can translate into higher resale value compared to less efficient homes.

Lower Ownership Cost
Compared with standard homes, ENERGY STAR certified homes use substantially less energy for heating, cooling, and water heating–delivering substantial annual savings. This adds up to thousands of dollars in savings over the years your own your home.

ENERGY STAR certified new homes must meet strict energy efficiency guidelines set by the U.S. Environmental Protection Agency. These homes are independently verified to be at least 15% more energy efficient than homes built to the 2004 International Energy Conservation Code (IECC), and feature additional measures that deliver a total energy efficiency improvement of up to 30 percent compared to typical new homes and even more compared to most resale homes.

EPS built homes can average as much as 50% better efficiency than standard existing home construction.

Versatile Design Options

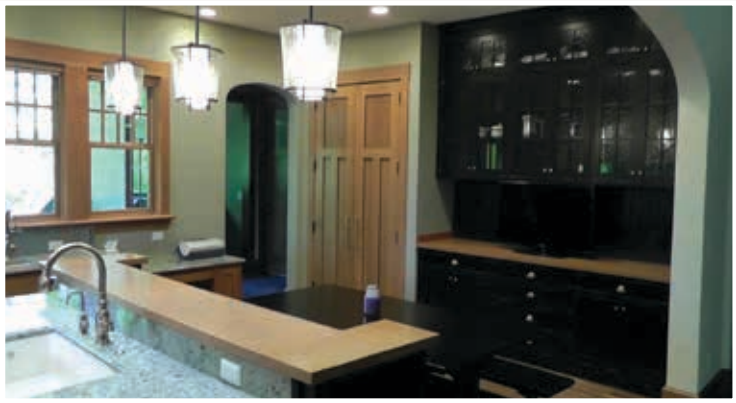
Whether you are looking for a moderate home, the home of your dreams, or a multi-family investment, EPS can meet your building needs.

Interior vaulted ceilings offer a dramatic style to your home.

Tray ceilings can add visual appeal to your home.

Decorative glue-laminated beams give a rustic, open look.

An engineered window wall.



Unique kitchen designs can be incorporated into your EPS home.

Unique Features Of EPS SIPs Construction

EPS SIPs ARE:

- A complete pre-engineered package
- Engineered to IBC Code
- Made with over 30 years experience
- Built by local builders

SIPSs ALSO:

- Reduce size of HVAC equipment
- Earn energy efficiency tax credits & rebates
- Are up to 15 times more air tight than stick-built
- Allow subcontractors access sooner
- Save up to 50% or more on energy costs
- Whole-wall R-value outperforms fiberglass insulation

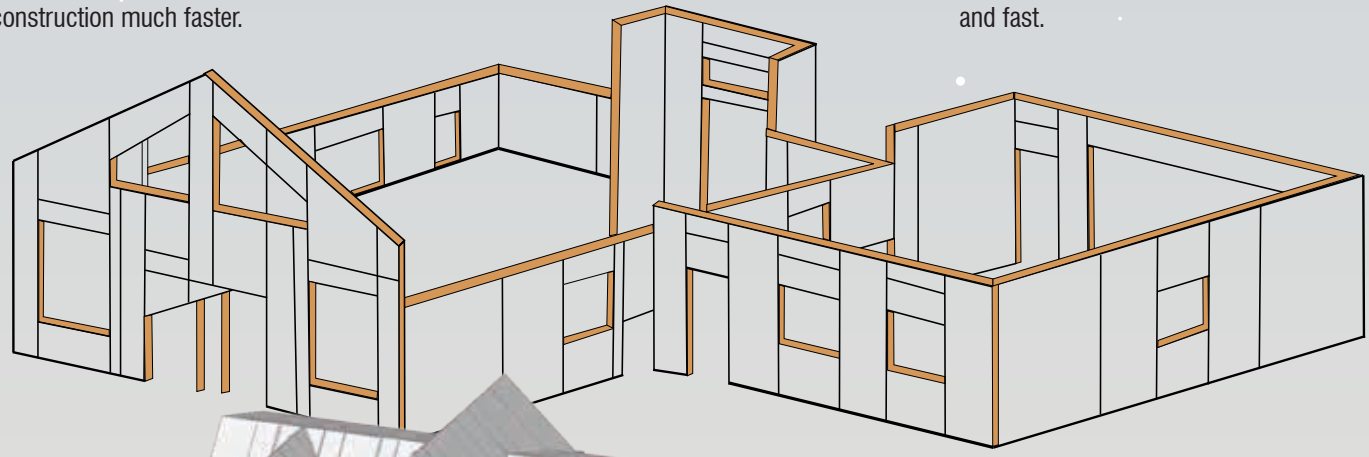
EPS SIPs ARE INSECT RESISTANT:

EPS panels are treated with an effective, non-toxic additive that will deter insects. The additive is environmentally sound and contains no dyes, formaldehyde or ozone-depleting HCFC's. The additive is inert, non-nutritive, highly stable and therefore will not decompose, decay or produce undesirable gases or leachates. The insect-resistant foam panels are recyclable and safe for waste-to-energy systems and landfills. The treatment is a process which uses a natural mineral formulated to resist normally occurring exposure to woodboring insects, specifically carpenter ants and termites. The non-toxic treatment is EPA Registered, meets the standards of ASTM D3345 and WPA EL 12-72, and lasts as long as the rigid insulation.

Energy Efficient, Cost-effective Design

Jumbo 8' x 24' panels can make construction much faster.

Field pre-assembled wall options are solid and fast.



EPS roof panels offer high vaulted ceilings and energy efficiency. Custom thickness and larger spans accommodate custom needs.

EPS SIPs package includes pre-assembled, factory-insulated headers, along with window and door cutouts and horizontal and vertical electrical chases (if requested.)

Advanced technology

EPS utilizes the most advanced technology with a Weinman CNC routing machine and HSB software that fabricates our panels and cut outs right from the engineer's drawings.

EPS is third-party inspected and certified under NTA Listing Report EPS102108-21.
Visit www.epsbuildings.com/technicalspecs for our construction manual details and code reports.

The Beauty Of EPS Homes

An EPS house is much more than an energy-efficient building — it's a beautiful place to call home, designed to meet your every need and every dream.

Want an open floor plan? We can do that. Need a spacious kitchen? Done. Walls filled with windows to take in the beauty of your view? No problem. A special ceiling to showcase your dining room? Sure thing.

Bring us your dreams and we'll help make them a reality.

This six-bedroom home located in Central Iowa earned an ENERGY STAR Rating of 53 and saves the homeowner over $2100 per year in heating and cooling costs.

"We are very pleased with our new home. It is very quiet, the temperature stays even throughout the house, and the energy efficiency has exceeded our expectations. SIPS are the only way to build a new home."–Sid and Linda Hayes

What Is Green Building?

DISSPELLING MYTHS:

Myth #1: Green building is too expensive.
There are many strategies for inexpensive green building, from right-sizing the structure to optimal value engineering to reducing waste.

Myth #2: Green building products don't work as well.
Experts agree that new green products work as well as, if not better than, their traditional counterparts.

Myth #3: Green Products are hard to find.
The number of green products and systems that are available has grown exponentially over the past few years.

Myth #4: Green homes are "weird" or "ugly."
It's honestly hard to tell the difference these days. Even solar power can be integrated in attractive and effective ways.

Myth #5: It's an all-or-nothing proposition.
Most builders employ some green techniques and continue to add more each year. It's simply a matter of how far you want to go with the idea.

LIFECYCLE ANALYSIS

Life cycle analysis (LCA) is the evaluation of the environmental impact of a particular product that takes into account its entire life cycle, from raw material extraction through production, operation, and demolition.

The LCA is the only way to truly gauge the environmental impact of a building material through a comprehensive analysis that judges all aspects of a material's interaction with the environment.

For example, many products save energy for homeowners. But how much energy do they save compared to how much energy was invested in producing and transporting the product? Are the carbon dioxide emissions prevented by the product greater than any harmful pollutants generated in the production process? Does the recycled product take more energy to create than a new product? These are the questions that LCA asks to determine the true ecological footprint.

A comparative LCA study conducted by BASF Corporation reveals that SIPs have a significantly lower environmental impact than conventional wood framing and fiberglass insulation. Not only do SIPs save energy, they also help decrease carbon emissions, water pollution, deforestation, damage to natural habitats, and emissions of other ozone harming gases.

Living Green:

According to ENERGY STAR, qualified homes built in 2010 are the equivalent of:

- Eliminating emissions from 65,251 vehicles
- Saving 394,704,024 lbs. of coal
- Planting 107,864 acres of trees
- Saving the environment 774,093,958 pounds of CO_2

Energy Efficient Construction Checklist

Energy-Efficient Builder
- Use a qualified knowledgeable authorized dealer/builder

Framing
- Structural Insulated Panels are 50% more efficient than stud walls and up to 15 times more air tight
- Completed Thermal Bypass Checklist

Effective Insulation
- Ceiling: R-49 or SIP roof panels
- Wall: R-19 or greater, R-26 SIP panels are ideal
- Basement wall: R-10/13 or greater, or SIP basement panels
- Band/rim joist: R-19 or greater, SIP/floor hangers are best
- Floor above unheated space: R-30 or greater
- Slab Edge insulation: required at Climate Zone 4 and higher (maximum of 25% of the slab edge may be uninsulated in Climate Zones 4-5)

High Performance Windows and Doors
- Make sure windows are ENERGY STAR rated
- U-factor less than or equal to 0.30
- Doors should have an R-value greater than or equal to 5

Tight Construction and Ducts
- Install ducts in conditioned spaces to minimize energy loss
- Seal ducts with mastic and/or UL 181 approved tape
- Size ducts base on the Air Conditioning Contractors of America Manual J and D.

Efficient Equipment
- Geothermal heating and cooling systems
- Natural gas furnaces: AFUE of 94 percent or higher
- Central air conditioner: 13 SEER or greater
- Natural gas water heaters: Up to 60 gal.: 0.62 EF or greater; 60-80 gal.: 0.85 thermal efficiency or greater
- Electric water heaters: 0.93 EF or greater
- Size your equipment properly for your home using Manual J or equivalent calculations. Bigger is not better!
- ENERGY STAR certified thermostat (except for zones with radiant heat)

ENERGY STAR Products
- Include at least one ENERGY STAR certified product category: Heating or cooling equipment; windows; water heating equipment; five or more ENERGY STAR certified light fixtures, appliances, ceiling fans equipped with lighting fixtures, and/or ventilation fans.

Third-Party Verification
- Review plans with Home Energy Rater
- Home Energy Rater does first inspection for air sealing and insulation
- Home Energy Rater tests for leakiness of building envelope and ducts

Energy-Efficiency Cash Rebates
- Energy-efficiency rebates vary by state due to differences in regulatory obligations.
- Look for local and national rebates in your area

Efficiency standards vary by climate zone, check your particular zone for details.

LEARN MORE AT energystar.gov

Build Your Dream Escape

An energy-efficient cabin provides:

Quality: The best construction techniques and details are used to better protect against cold, heat, drafts, moisture, pollution, and noise.

Performance: Your cabin can be erected in days, not weeks. It is engineered for maximum strength and durability. Designs can maximize interior loft and vaulted ceilings.

Responsibility: Your new home uses less energy which results in less pollution. Building green is good for the environment.

Flexibility: Offers a variety of finish options and is expandable in the future. Flexible design options can fit narrow or odd lot restrictions.

Multi-Family Units–Energy Efficient & Cost Effective

Three-story, 120-unit assisted living and memory care apartments rated 50% better than conventionally built.

"We recently finished construction of our second senior care facility utilizing EPS structural insulated panels. Our biggest challenge is to construct a project that will appeal to our residents. It is imperative that we do not compromise on the design of our facility. While these are important issues in the design phase, equally important is our sensitivity to the future operations of the facility including comfort of the residents and costs of operations. We spent several years looking for a product that could deliver on our vision. In selecting EPS and their engineered wall system, we found a partner that could meet our goals. We have marked our operational costs of EPS-built buildings vs. similar sized, traditional-built projects and have noted the efficiency at which they operate, resulting in a significant reduction in energy consumption and savings. Equally important is the positive feedback we have received from our residents regarding the comfort of the building and overall appeal of the design and layout."–Greg Johnson, Coventry Senior Living

Variety of duplexes and multiple attachments.

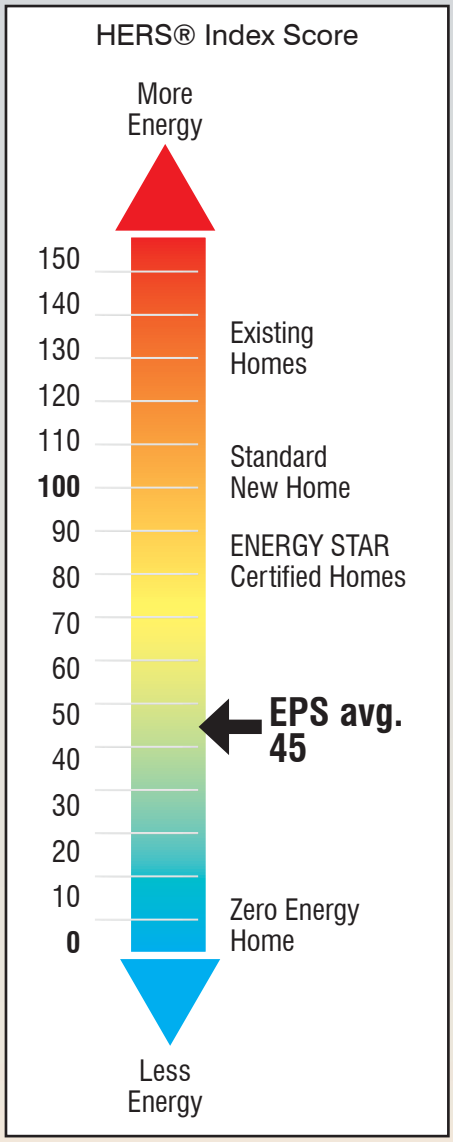
Coventry Senior Living Complex, Mahtomedi, Minnesota earned Energy Tax Credits and ENERGY STAR certified with a HERS Rating of 46.

2012 Building Excellence Winner
Awarded by the Structural Insulated Panel Association in the Multifamily Category

"SIPs are a viable alternative method that meets the structural requirements of the codes, and they have advantages over stick-built framing as they are constructed in a controlled environment and they have a greater ability to provide thermal performance above traditional fiberglass insulation, as well as providing a thermal moisture barrier with better efficiency than typical methods."
–City Building Inspector

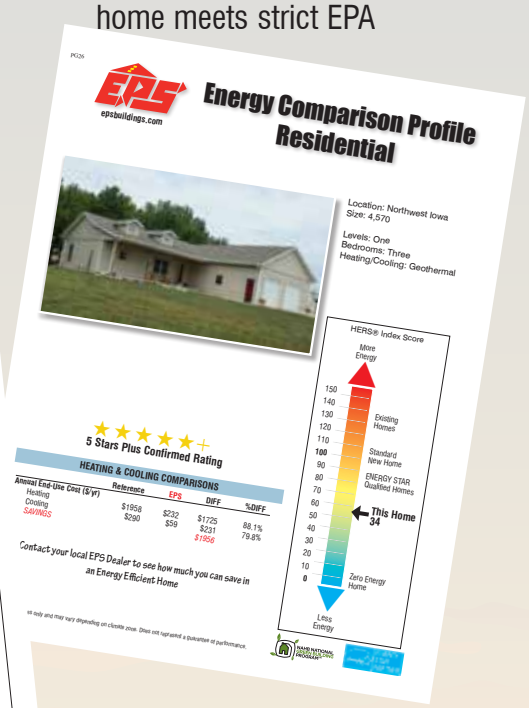
Lower Numbers Mean Higher Savings

2012 Building Excellence Winner
Awarded by the Structural Insulated Panel Association in the Single Family over 3,000 sq. ft.



■ An ENERGY STAR home receives a certificate showing the HERS Rating. The lower the number, the lower the energy costs. A standard new American construction home that adheres to current energy guidelines is awarded a default HERS Index score of 100, which serves as a benchmark against which all other homes are measured. A higher HERS Index score translates into a less energy efficient home, and vice-versa. A typical American resale home scores 130 on the HERS Index, making it 30% less energy efficient than a new construction home. On the other hand, if a house gets a HERS Index score of 50, it means that it's 50% more energy efficient than a standard new construction home.

To get a HERS rating, a home energy rater must conduct on-site inspections and testing of the home. These tests are done during and after construction to make sure the home meets strict EPA guidelines.



■ Ask to review our ENERGY STAR profiles for comparisons on energy useage and costs.

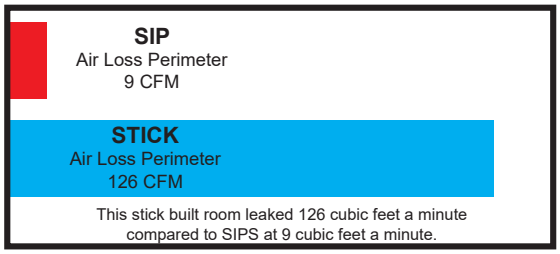
Keeping Your Family Comfortable

With people spending 90% of their time indoors, buildings should create a safe environment for occupants, free from mold, volatile organic compounds (VOCs) or other harmful airborne pollutants.

A SIP home allows for better control over the indoor air quality because the airtight building envelope limits incoming air to controlled ventilation. Controlled ventilation filters out contaminants and allergens and also allows for incoming air to be dehumidified, reducing the possibility of mold growth.

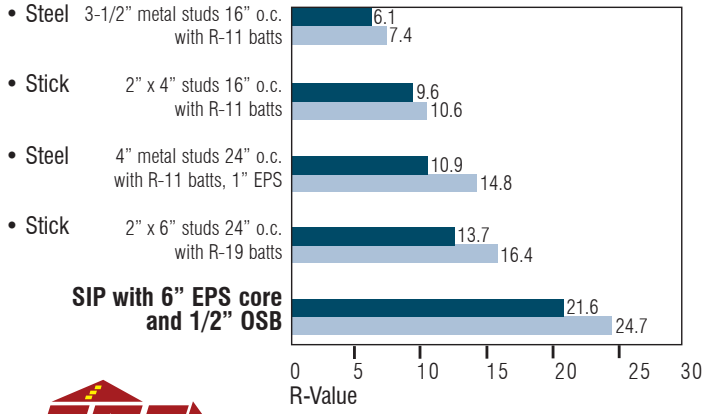
Wall Type	Plate Thickness	Panel Thickness	Panel Make Up	Whole Wall R-Value at exterior temp. of 75°	40°	Whole Wall R-Value NEOPOR® 75°	40°	Weight (PSF)
R-18	3⅝	4½	7/16 OSB, 3⅝ EPS, 7/16 OSB	18.0	20.6	20.25	22	3.3
R-26	5⅝	6½	7/16 OSB, 5⅝ EPS, 7/16 OSB	22.8	24.1	29.25	31.5	3.5
R-33	7⅜	8¼	7/16 OSB, 7⅜ EPS, 7/16 OSB	30.1	31.8	37.00	40.0	3.6
R-40	9¼	10⅛	7/16 OSB, 9¼ EPS, 7/16 OSB	38.5	40.0	46.0	50.0	3.9

Tests Verify Air-Infiltration Performance



Whole Room Air Filtration-ORNL Testing

COMPETITION



Source: OAK RIDGE NATIONAL LABORATORY

Wall Surface Temperature Comparison Tests

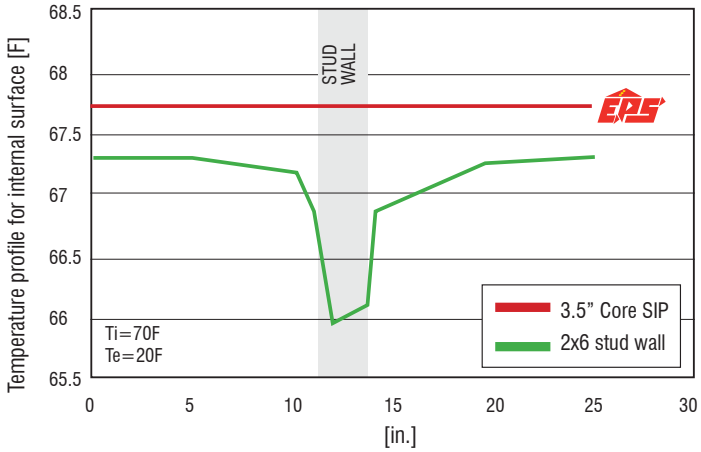


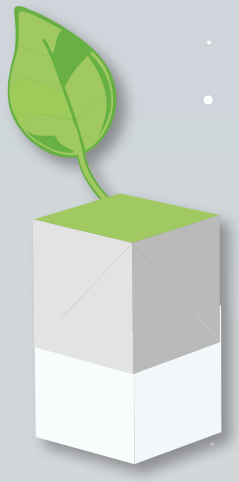
Figure 4. Temperature comparisons for SIP wall and conventional 2x6 wood frame walls. The interior surface temperature of stud walls drops significantly while SIP walls remain a constant temperature.

SOURCE: OAK Ridge National Laboratory

LOOK AT THESE ADVANTAGES:

- No sagging insulation
- No purlins or girts to compress insulation and reduce R-value
- Reduced air infiltration
- Translates into large savings on your utility bills

Quality
Comfort
Durability



One of the most significant factors to maintaining clean fresh air is to have airtight buildings and proper air exchanges. EPS walls are up to 15 times more airtight than stud walls. An EPS SIP home can address all your indoor comfort needs by eliminating air infiltration and increasing your insulation value — yielding greater comfort to your family.

"We are anxious to begin making our new house a home. The entire building experience has been a delight."

John and Kathy David

EPS BUILDINGS

epsbuildings.com

Energy Panel Structures

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BBL Construction
Perryville, MO

Fingerlakes Construction
Clyde, NY

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Efficiency Solutions

SIPA Structural Insulated Panel Association

APA

WTCA Wood Truss Council of America 608/274-4849 www.woodtruss.com

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