

## Building Green and LEED

### Building Green

#### R-Value

The whole wall R-value is a measure of thermal resistance used in the building and construction industry. Under uniform conditions it is the ratio of the temperature difference across an insulator and the heat flux (heat flow per unit area) through it. The bigger the number, the better the building insulation's effectiveness.

"R" Value of PorterSIPs

Panel Thickness	Panel "R" Value
4 1/2" (11.4 cm)	15.2
6 1/2" (16.5 cm)	24.7
8 1/4" (21.0 cm)	33.0
10 1/4" (26.0 cm)	42.5
12 1/4" (31.1 cm)	52.0

#### Minimal Environmental Impact

By weight, SIPs use approximately 89% engineered wood (OSB), 10% EPS foam plastic and less than 1% water activated urethane adhesive.

- = OSB is a rapidly renewable, recyclable, biodegradable resource. It comes from small, fast-growing trees that are underutilized or are species grown in managed forests. OSB makes the best use of forests and has been found to be better for the environment than fiberglass, steel or concrete in terms of energy, emissions and waste.
- = Typical SIP walls use only approximately 12-20% of the dimensional lumber used in the exterior walls of typical stick-built construction.
- = EPS foam plastic is made from carbon and hydrogen that come from crude oil. The use of this material as insulation reduces the demand for fuel, a much better use of the raw material.
- = The amount of energy required to make EPS foam plastic is 24% less than the energy used to produce equivalent R-value fiberglass batting insulation.
- = The adhesive used in bonding the OSB skins of the panel to the EPS core is water activated, and contains no solvents and emits no VOCs during curing.

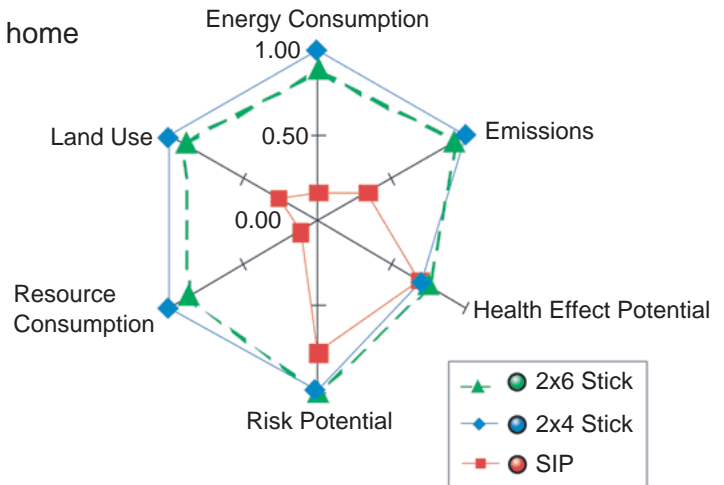
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The award-winning BASF Eco-Efficiency Analysis looks at environmental impact in proportion to a product's cost-effectiveness over the entire lifecycle of a product or system. In a recent evaluation of residential insulation systems, the SIP-built structure was the clear winner over traditional stick construction. Key contributors to the performance of SIPs in this study include:

- = Reduced heating and cooling loads over lifetime of home
- = High R-value
- = Low air leakage rate
- = Low environmental impact of materials
- = Low maintenance requirements



## LEED Points and Certification

Leadership in Energy and Environmental Design (LEED) provides a rating system for construction that factors in energy use and environmental design. SIP construction is included and can assist in the LEED point system, which can be important to builders and owners for tax and grant assistance.

LEED New Construction and Major Renovations Version 2.2	Points Our Products Can Assist With
<b>Energy and Atmosphere, Prerequisite 2 Minimum Energy Performance</b>	
Meet the mandatory provisions and prescriptive requirements of ASHRAE/IESNA 90.1-2004.	Required
<b>Energy and Atmosphere, Credit 1 Optimize Energy Performance</b>	
Exceed the minimum requirements for energy performance. Depending on the option pursued up to 10 points possible.	10
<b>Material and Resources, Credit 2.1, 2.2 Construction Waste Management Divert 50% and Credit 2.2 Divert 75% from Disposal</b>	
Reduce amount of construction and demolition waste from disposal in landfills or incinerators.	1 w/ Credit 2.1, 1 w/ Credit 2.2, and 1 Exemplary Performance, Innovation in Design Divert 95%. Total 3 potential points.
<b>Indoor Environmental Quality, Credit 4.1 Low-Emitting Materials Adhesives &amp; Sealants</b>	
The adhesives and sealants that are used on the interior of the building shall comply with South Coast Air Quality Management District (SCAQMD) Rule 1168. "Structural wood member adhesive" must be under 140 g/1 less water.	1
<b>Indoor Environmental Quality, Credit 4.4 Low-Emitting Materials Composite Wood &amp; Agrifiber Products</b>	
Composite wood and laminating adhesives used on the interior of the building shall contain no added urea-formaldehyde resins.	1

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LEED for Homes	Points Our Products Can Assist With
<b>Sustainable Sites, Credit 5 Nontoxic Pest Control</b>	
<b>Credit 5 Pest Control Alternatives</b> Requires design features of the home to minimize need for poison for control of insects, rodents, and other pests. <b>5b</b> of credit requires all external cracks, joints, penetrations, edges and entry points be sealed.	1/2 point
<b>Energy and Atmosphere, Credit 1 Optimize Energy Performance</b>	
<b>Prerequisite 1.1 Performance of Energy Star for Homes</b> Requires that the performance requirements for Energy Star for Homes are met, including the third-party inspections.	Required
<b>Credit 1.2 Exceptional Energy Performance</b> Exceed the performance of Energy Star for Homes by using the equations that rate the Home Energy Standards (HERS) Index to the applicable number of LEED points.	34 points max
<b>Energy and Atmosphere, Credit 2 Insulation</b>	
<b>Prerequisite 2.1 Basic Insulation a)</b> Install insulation that will meet or exceed the R-value requirements listed in the 2004 International Energy Conservation Code Chapter 4. <b>b)</b> Insulation must meet the national Home Energy Rating Standards Grade II specifications.	Required
<b>Credit 2.2 Enhanced Insulation a)</b> Insulation shall exceed the R-value requirements listed in the 2004 International Energy Conservation Code Chapter 4 by at least 5%. <b>b)</b> Insulation must meet the National Home Energy Rating Standards Grade I specification.	2 points max
<b>Energy and Atmosphere, Credit 3 Air Infiltration</b>	
<b>Prerequisite 3.1 Reduced Envelope Leakage</b> Meet the air leakage requirements by Climate Zones referenced in the table under this credit in the LEED Rating Guide.	Required
<b>Credit 3.2 Greatly Reduced Envelope Leakage</b> Meet the air leakage requirements by Climate Zones referenced in the table under this credit in the LEED Rating Guide.	2
OR	
<b>Credit 3.3 Minimal Envelope Leakage</b> Meet the air leakage requirements by Climate Zones referenced in the table under this credit in the LEED Rating Guide.	3
<b>Material and Resources, Credit 1 Material-Efficient Framing</b>	
<b>Prerequisite 1.1 Framing Order Waste Factor</b> Keep the estimated waste factor to less 10% or less.	Required
<b>Credit 1.2 Detailed Framing Documents</b> Requires detailed framing plans to be used on job site.	1
<b>Credit 1.3 Detailed Cut List and Lumber Order</b> Meet requirements of 1.2 and prior to construction have a cut list and lumber order that matches up to the framing plans and/or scopes of work.	1
AND/OR	
<b>Credit 1.4 Framing Efficiencies</b> Implement measures from table in Rating System, table includes: SIP walls 1 point, SIP roof 1 point, SIP floors 1 point	3
OR	
<b>Credit 1.5 Off-Site Fabrication</b> Panelized construction	4
<b>Material and Resources, Credit 3 Waste Management</b>	
<b>Prerequisite 3.1 Construction Waste Reduction a)</b> Generate 2.5 pounds or less of the net waste per square foot of the conditioned floor areas. <b>b)</b> Divert 25% or more of materials taken from project site from landfills or incinerators.	3