

SIPs and the 2009 IECC

In January of 2009, the International Code Council released the 2009 International Energy Conservation Code (IECC). The 2009 version of the code marks a 12 to 15 percent increase in residential energy efficiency over the 2006 version. For residential builders, complying with the 2009 IECC may require changes in their current building practices as it is adopted by local jurisdictions across the country. Faced with these additional measures, more and more builders are looking at structural insulated panels as a simple solution for energy-efficient building enclosures. SIPs can save builders time and money when it comes to meeting the 2009 IECC.

Building enclosure

The prescriptive building enclosure requirements in the 2009 IECC require more insulation and lower fenestration U-factors in some climate zones. The continuous insulation provided by SIPs can help builders meet these increased requirements through either the total UA alternative method or the simulated performance alternative. The total UA alternative method (Section R402.1.4) accounts for the thermal bridging in wood frame wall assemblies and in some cases allows builders to use SIPs with a nominal R-value lower than what is specified for cavity insulation. Under the simulated performance alternative, energy modeling software is used to compare the energy use of a SIP home to the standard reference design.

Insulation Requirements

Climate Zone	Wood Frame Wall R-Value	Ceiling/Attic R-Value
1-3	13	30
4 except Marine	13	38
5 and Marine 4	20 or 13+5*	38
6	20 or 13+5*	49
7 - 8	21	49
<i>*First value is cavity insulation, second value is continuous insulation or insulated siding.</i>		

Building enclosure requirements under the performance path have also been increased in the 2009 IECC. Builders can no longer trade off efficient HVAC equipment for building envelope performance, and the assumed window area of the standard reference design has been decreased to 15 percent of the home's floor area. Under the performance path, the continuous insulation and air tightness of a SIP building enclosure offer builders a helpful boost towards meeting the required energy performance.

Whole house air infiltration

A major addition to the 2009 IECC is the examination of whole house air infiltration by either blower door testing or a visual inspection of the building enclosure. Builders opting for blower door testing must reach an air infiltration rate of 7 air changes per hour at 50 Pa (ACH50) or less. A SIP building enclosure that is installed to the manufacturer's specifications will easily meet this level of air tightness. Alternately, a building inspector can visually verify proper air sealing at a number of locations listed in Table R402.4.2. Insulation must be in full alignment with an air barrier and properly installed in often ignored situations such as small cavities, knee walls, and behind showers. SIPs deliver continuous insulation that is fully enclosed with OSB—a code-compliant air barrier. With a full SIP building enclosure, many problem areas are inside conditioned space and do not require any additional effort.

Duct insulation and sealing

Supply ducts need to be insulated with R-8 duct insulation, and all other ducts need to be insulated with R-6 insulation unless they are located in conditioned space. Placing ducts in the conditioned attic created by a SIP roof avoids this requirement. If the ducts and air handler are located in conditioned space, the builder can avoid the duct leakage testing requirement as well.