

Energy Calculations and PBS SIPs

Energy efficiency is paramount in today's economy. Most everyone is concerned about conserving our natural resources and finding alternate sources of energy. PBS SIPs are helping Americans reduce energy use. Compared to traditional "stick built" construction, PBS SIPs save building owners up to 60% on monthly utility bills.

HVAC professionals are able to account for this energy efficiency in the design of the mechanical systems in PBS SIP homes provided they have the proper information. Mechanical professionals use ACCA (Air Conditioning Contractors of America) Manual J as the design guide to calculate the requirements for the heating and cooling systems in our residential structures. Today, these calculations are computer based, but two important PBS SIP properties need to be input into the software to provide meaningful results.

Manual J based calculations require the R-Value of the insulation material and the air infiltration rate, or air leakage rate. The R-Value is relatively straight forward. However, the air infiltration rate for PBS SIPs must be addressed properly. Design guidelines for Manual J calculations suggest a reasonable air leakage assumption between 0.35 to 0.50 natural air-changes per hour, unless a builder has data specific to their construction practices indicating they build tighter (or looser). This recommendation is for stick built homes.

PBS has blower door test data generated from homes using SIPs for the exterior walls and roof of homes that test out at .04 to .06 natural air changes per hour. These values for SIPs are on the order of 10 times better than what the Manual J design guidelines suggest. This reinforces what home owners have known for years about PBS SIPs energy efficiency.

PBS recommends that a value of .05 natural air changes per hour be used when performing Manual J heat loss calculations on homes using PBS SIPs as the exterior walls and roof. If the software being used does not allow for numerical input, select the tightest option.