



# Residential Construction

Structural Insulated Panels (SIPs) are modern engineered building components that combine great structural strength with outstanding energy performance.

## **ERECTING A STRUCTURALLY SOUND THERMALLY EFFICIENT HOUSE IN HOURS NOT WEEKS**

# Greenix™ Panels

**Greener. Cleaner. Safer. Stronger**

**Worldwide Supplier of Structural Insulated Panels**

## SIPs WALLS & ROOF

- Walls manufactured to meet roof pitch
- Panels can be delivered with doors installed
- Pre-formed 90 degree Corner Panels delivered with electrical outlets in place
- Panels delivered with openings for HVAC, windows & doors
- Beams set on walls supported roof panels
- Stronger than stick built or modular.
- SIP Supply uses a 4 to 1 safety margin for load capacities.
- Class 4 hurricane wind rating (160 mph to 180 mph tested)
- SIPs are Energy Star Rated by the US Department of Energy.





## SIP Benefits for Builders

**Speed of construction.** You can order the panels with all pre-cutting performed in a factory. They show up on the jobsite all pre-numbered, ready for assembly corresponding to numbers laid out on a set of shop drawings. On most jobs you should be out of the weather and dried in sooner. Time is money.

**Fewer framers.** A crew can consist of one lead framer assisted by minimally skilled helpers. Whenever a job involves craning panels up to frame a roof, it helps to have two people familiar with panels: one on the roof and one on the ground.

**Rigid frame.** It's easy bracing SIP walls. In fact, once you have two corner panels up, you can lean a ladder against the panels when needed. SIP Supply panels "lock" together with a special cam locking system. Starting with a corner you build a wall. As the panels are locked they form a straight rigid uniform wall that becomes a single structure.

**Less jobsite waste.** If you've ordered a set of panels with all rough openings for windows and doors pre-cut at the factory, the only true waste you'll have is taking a few cases of empty tubes of adhesive caulk containers to the dump. And the factory can efficiently collect and recycle their cut-outs much more effectively than you can at the job site.

**Less theft.** While 2x4s and 2x6s are prone to "walking off" unsecured job sites, panels are too specific to the site's building system to be worth hauling off somewhere else.

**Cost competitive.** While most builders say they pay a little more for SIPs than for the comparable framing and insulation package in a stick-built home, as a group they believe the benefits are worth the costs. The amount extra they pay varies; while a few say it costs them an extra \$1 per square foot of finished floor area, the amount may be higher when roof panels are used. However, when roof panels enclose extra living space in a loft, the price per square foot is surprisingly competitive. If at the design stage you optimize a structure to use panels, the most experienced SIP builders then say a house framed with SIPs should cost about the same as a house framed with comparably sized dimensional lumber, and maybe even a little less.

**Easier to hang drywall.** There is solid backing for all drywall against exterior walls, which means there is less cutting, faster attachment and less waste material.

**Fewer framing callbacks.** Wall panels go in plumb, square and straight. Once in place, a SIP won't warp, twist or check.

**Increased referrals.** A fair number of small builders report their marketing efforts have decreased while word of mouth referrals have increased ever since they started using SIP building systems.



Insulation R30, door & window openings and electrical boxes ready for installation

2 hours after placing the first panel the walls are ready to receive roof trusses.



Front of House

5 weeks after the first panels were placed the house is ready for occupancy







## SIP Benefits for Home Buyers

**Extremely strong structure.** There is considerable evidence that homes with SIP wall and ceilings have survived natural disasters like hurricanes, tornadoes, straight-line winds and earthquakes better than traditional stick-framed homes right next door.

**Lower energy bills.** Discounting the "human factor"-thermostat settings and so forth-a number of side-by-side tests show that between 15% and 60% less energy should be needed to heat and cool a home with SIP wall and ceiling panels. In tests by Oak Ridge National Laboratory, SIP walls outperform fiberglass walls by over 50%.

**Improved comfort.** Thanks to extra R-values and tight construction, the wall and ceiling surfaces in a SIP home will stay warmer than in stick-framed homes. The warmer those surfaces are the more comfortable the home is.

**"Freeze Proof."** What happens if the power goes down? During the late 1990s, several New England SIP homes survived over a week without power or a wood stove and never came close to freezing.

**Indoor Air Quality.** While there is no guarantee here, most homes built with SIPs are tight enough that builders can't ignore upgrading mechanical ventilation compared to that found in a standard home. In many studies in North American housing, the best indoor air quality is found in homes that are tight and equipped with upgraded mechanical ventilation.

**Green building product.** On a life-cycle basis, a more energy-efficient house built with SIPs will be less damaging to the environment, in terms of overall resource consumption. Much less dimensional lumber is used in a SIP home than in a traditional framed structure.

**Quieter.** The insulation quality is so great that outside sound does not resonate in the structures making it quieter and more comfortable for the occupants.

**Higher Resale Value.** Reports conclude that an energy efficient SIP built home has a higher resale value than a traditionally built home.



## Structural-Thermal Envelope

Consumers tend to think of R-value as having prime importance. But effective air sealing is really more significant. For the best energy performance, you need a continuous air barrier and uniform insulation coverage, with as few gaps as possible. Every air leak and every thermal bridge adds to your heating and cooling bills. SIP Supply's Greenix SIP panels themselves are air-tight and fully insulated (R25 or R40); so in building your SIP house, we pay close attention to joints and structural connections. We use panel sections that maximize the thermal envelope and we make each joint airtight. The SIP envelope is the combination of the foundation, the walls, and roof working together providing a comfort level inside by maintaining temperature and relative humidity thus reducing heating and air conditioning requirements in a safe environment. The structural integrity of the building holds up the building protecting the contents against rain, wind and groundwater. The envelope also prevents insect and vermin infestation and condensation inside the structure.

## Why do SIPs out perform normal framing?

SIP constructed buildings are more energy efficient, stronger, quieter and draft free than older technology systems, like stud framing with common fiberglass insulation. Fiberglass is sometimes used for furnace filters because air moves through so freely. Rigid insulation is used as a solid component insulation in almost every industry for its inherent efficiency and lack of air movement. These attributes are built right into our SIPs building. Less air movement or leakage translates into less drafts, fewer penetrations for noise, lower energy bills and a significantly more comfortable and controllable indoor environment.

## Why are SIPs so much stronger?

Our SIPs are a structural composite, kind of like an 'I'-beam. The skins act like the flanges and the rigid core is similar to the web. Urethane foam is injected between the sub-straights and binds them together tenaciously. In short, the three components work together, rather than against one another. This composite assembly yields stiffness, strength and predictable responses to load factors.

## How about ventilation?

All of the advanced technology building systems require some sort of mechanical ventilation. These systems bring fresh air into the home or building and exhaust the moisture laden or stale air to the outside. Often they can be combined with filter systems or other fresh air devices. Not only is ventilation practical, but a code requirement in many areas. Many HRV's or heat recovery ventilators are available from your mechanical contractor.

## Insulation

Injected Polyurethane provides the highest insulation value on the market today. At SIP Supply we pay close attention to foam density and cell structure to insure your house insulation exceeds local standards. While there are different quality grades of Polyurethane, such as the lesser grades used by other manufacturers and cheaper import products, our closed-cell foam has very low permeance or potential for water vapor to pass through it. This provides protection against moisture transport into the insulation with its related potential for condensation. Vapor that remains on the inside (the warm side) will not come in contact with cold surfaces where the dew point can be reached. This means indoor comfort levels are more easily maintained. The foam process used by SIP Supply in our panels is the best product for the environment in production and for the core of our Panels.

### Foam Physical Characteristics



**HCFC-22**  
"Tear Drop" Voids in foam  
Somewhat uneven densities  
Good adhesion to skin



**HFC-134a**  
Somewhat uneven densities  
Somewhat weak adhesion  
Small voids in foam

### SIP Supply



**HFC-245fa**  
Fine/uniform cell size  
Good Dimensional stability  
Good adhesion to skin  
Even densities

- └ Polyurethane foam helps to avoid mold and mildew growth
- └ Will not support nesting by vermin
- └ Contains no formaldehydes
- └ Maintains indoor comfort level.
- └ It is environmentally friendly
- └ Reduces fuel consumption and reduces energy costs related fossil fuel emissions
- └ Reduces the materials needed for construction of energy-efficient buildings.
- └ Reduces infiltration of noise — it's quieter inside
- └ Urethane foam insulation is durable and provides consistent performance over the lifetime of the structure.