PFF SIPS Are the Best Choice!

PFF's structural insulated panels (SIPS) are an innovative choice to meet domestic and international housing needs.

STRUCTURAL INSULATED PANELS
PFF's SIPS are composed of composite-building materials that consist of a rigid foam core (expanded polystyrene) sandwiched between 26-gauge galvalume steel. PFF panels have been ASTM tested and UL fire-tested and are certified by the Florida Product Approval Commission, FL #13379 and FL #13381. PFF's high-quality manufacturing process and panel composition makes our panels a superior product, as noted by obtaining Florida's Product Approval.

STRUCTURAL PERFORMANCE
SIP-built structures are better than traditional construction because they are:
· Structurally stronger than conventional stick-framed housing construction
· Erected quickly
· More energy efficient
The steel exterior layers combined with the rigid foam core is much stronger and replaces the framing, sheathing, insulation and vapor barrier associated with standard-frame built homes. PFF's SIPs replace all of these standard housing components and, in most cases, our SIPs are structurally self-sufficient. SIPs can span longer distances, therefore reducing the amount of supports that may be needed in conventional housing design.

PFF is leading the worldwide movement for building with Structural Insulated Panels (SIPS). SIPS are the basic component to create sustainable, self-contained shelters, homes and buildings. PFF practices environmentally responsible building methods that result in a small amount of waste – all of which is recycled. The production methods allow for the construction of housing that is stronger, quicker to build and better insulated than conventional building products. This provides a structure that is cooler in the hot weather and warmer in the cold weather, which results in a significant reduction of energy costs. Houses constructed with the PFF building system are fully sustainable and will last for generations. All PFF buildings are designed to use solar and wind power for continuous electricity which allows for the inclusion of water purification systems.

PFF’s SIPs are engineered to the highest rating for both hurricane and earthquake protection. Florida International University’s (FIU) Engineering Department has designated the PFF panel as the product of choice for its rebuilding projects in Haiti. These projects include the University of Haiti, a hospital and a prosthetics center.

WORLDWIDE HOUSING SOLUTIONS
There is a great demand for worldwide housing needs, whether the needs are driven by natural disasters, poverty-stricken countries requiring assistance or the global initiative to become more eco-friendly, known as “green building.” Our structural insulated panels (SIPS) offer an alternative solution to a global problem. PFF’s “Little Haiti House” has earned international recognition. This small modular home can be constructed in less than 2 hours.

CALL: 770-464-2603
EMAIL: dan@precisionfoamfabricators.com
### PANEL CONSTRUCTION

- The complete assembly allows for a system that is structurally stronger than conventional stud frame structures. The EPS core provides rigidity and the metal skins provide flexural and compressive strength.
- The structural characteristics of PFF’s panels are similar to that of a steel I-Beam. The galvanized steel skins act as the flange of an I-Beam, while the rigid foam core provides the web of an I-Beam. This design gives SIPs an advantage at handling compressive loads. SIPs can be engineered for most applications.
- Roof panels and walls are engineered to withstand winds up to 150 miles per hour and are flexible and stable in earthquake-prone areas. Three-dimensional structural continuity provides rigidity and stability by creating an uninterrupted layer over supporting or load-bearing beams.
- The solid foam core of the insulated panels is resistant to moisture absorption, thus making it resistant to insects, mold and mildew.

### FEATURES

- Factory fabrication helps to speed up and simplify a builder’s construction schedule, greatly reducing construction time.
- Fewer trades are needed.
- Prefabrication reduces chance of material losses from job site keeping the cost under control.
- Panels readily meet US building codes in the hurricane or earthquake prone zones.
- Structural insulated panels replace traditional frame construction and fiberglass insulation.
- A special structural-grade adhesive is applied to both sides of the unfaced foam core.
- EPS foam core and metal skins are permanently bonded together by a 2-part thermosetting structural adhesive.
- Environmentally friendly component materials are used in the panel fabrication process. Our foam core is formulated and treated to resist moisture, heat, cold, termites and other wood boring type insects.

### ADVANTAGES OF A PFF SIP STRUCTURE

- Requires no water for construction
- Resistant to insects, mold and mildew
- Minimal maintenance required
- Withstands high winds
- Airtight construction against rain, wind and sand
- Airtight construction creating extremely high thermal performance
- Highly energy efficient for solar adaptation
- Offer fewer chances for failure or mistakes
RESIDENTIAL BUILDINGS
Uses solar power & wind energy to maintain cost-effective design
Interior and exterior can be custom-finished to the homeowners’ specifications
The interior can have all standard finishes such as drywall, wood or architectural finishes. The exterior can be stucco, brick, stone veneer or various types of siding materials.

MULTI-FAMILY HOUSING
27.9 square meters per unit / 300 square feet per unit
Designed, produced & delivered for earthquake response in L’Aquila, Italy

CUSTOM-BUILT HOMES
Multi-level houses can withstand hurricane-strength winds and earthquakes
Provides a thermal-efficient environment by using high performance PFF panels

COMMERCIAL BUILDINGS
Units can be custom-designed to include any of the following:
- Solar power
- Climate control
- Refrigeration
- Water

MULTI-USE BUILDINGS
Secured warehouses can be used for:
- Offices
- Schools
- Medical centers
- Barracks
- And many others

GOVERNMENT-USE BUILDINGS
Various layout options make SIPs viable to construct buildings for multiple purposes
- Government housing units
- Medical clinics and hospitals
- Government buildings or other actual purpose
Permanent or temporary units available
PFF STEEL-FACE SIPS EVEN OUTPERFORM OSB WOOD-FACED PANELS
Studies for the DOE conducted by the Oak Ridge Nation Laboratory (ORNL) document the energy savings of insulated panels versus traditional insulation. ORNL’s testing shows that the whole wall R-Value of a 4-inch OSB-faced SIP wall rated at R-14 outperforms a 2x6 stick-framed wall with R-19 fiberglass insulation (see illustration). However, PFF’s eco-friendly, steel-faced structural insulated panel has a 30% higher R-Value than the OSB-faced SIP. Our higher R-Value means that PFF’s panel is safer for the environment and uses less energy than the OSB-faced panel. PFF SIPs are simply the smartest choice.

PFF SIPS ARE 15x MORE AIRTIGHT THAN TRADITIONAL CONSTRUCTION
Up to 40% of a traditional home’s heat loss is due to air leakage. In response to this, SIPs have demonstrated amazingly low blower door test results when properly sealed. ORNL’s blower door tests reveal that a SIP test room is 15 times more airtight than its stick frame counterpart with fiber glass insulation. Based on the reliable performance of SIPs, “ENERGY STAR for Homes” chose to eliminate the required blower door test for SIP homes to meet Energy Star standards.

INTERNATIONAL SUSTAINABLE HOUSING UNITS & SHELTERS
RAPID DEPLOYMENT — Unit Built In Less Than 2 Hours!
Our Rapid Deployment structures are self-sufficient units that are able to resist earthquakes and hurricane strength winds. The eco-friendly unit’s walls and roof are constructed entirely of panels. It relies on solar energy and wind power to help keep costs down. Each unit uses moisture and insect-resistant insulated panels and can be fitted with solar panels, LED lights and a rain water purification system. PFF strives to provide homes that are cost-effective, energy-efficient and structurally-sound.

From this.... To this....

SELF-SUFFICIENT, HURRICANE-WITHSTANDING HOUSING IN LESS THAN 2 HOURS!!!
### Prescribed Test Method

<table>
<thead>
<tr>
<th>Test Method</th>
<th>Explanation of Test or Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida Product Approval - Structural Wall Approval Code: FL # 13381</td>
<td>The PFF structural panel has been evaluated &amp; approved for structural use in locations adhering to the 2007 Florida Building Code except for those sections of the code relating to HVHZ.</td>
</tr>
<tr>
<td>Florida Product Approval - Roof Deck Approval Code: FL # 13379</td>
<td>The PFF panel has been evaluated &amp; approved for use in locations adhering to the 2007 Florida Building Code except for those sections of the code pertaining to the HVHZ.</td>
</tr>
<tr>
<td>ASTM E1996-02</td>
<td>The PFF panel has been evaluated for use in actual hurricane conditions with regards to windborne debris</td>
</tr>
<tr>
<td>ASTM E1886-02</td>
<td>The PFF panel has been evaluated for durability after multiple Missile Impacts and many hours of wind pressure differential cycling, repeated bending of the panel in opposing directions.</td>
</tr>
<tr>
<td>ASTM E1592 - 01</td>
<td>Standard test method for the structural performance of sheet metal Roof and Siding Systems by uniform static air pressure difference - Panel is observed for deflections and deformations.</td>
</tr>
<tr>
<td>ASTM E108 - 04</td>
<td>Fire Testing</td>
</tr>
<tr>
<td>UL 1715 (UBC 26 -3)</td>
<td>Fire Testing</td>
</tr>
<tr>
<td>ASTM E90</td>
<td>Test method to determine sound transmission loss. The 6” thick PFF panel completed all testing protocol following ASTM E413 and proved to have a Sound Transmission Classification of 20.</td>
</tr>
<tr>
<td>AC 05 ICC-ES Panel Adhesive Test</td>
<td>Accelerated Age Testing protocol designed to determine the aging expectations for the composite PFF panel, EPS foam core and the Voracor XR1300 2-part thermosetting adhesive system.</td>
</tr>
<tr>
<td>ASTM E 72-02</td>
<td>Racking &amp; Shear Wall Load with and without Corner Condition</td>
</tr>
<tr>
<td>ASTM C 1363 - 05</td>
<td>Thermal Performance</td>
</tr>
<tr>
<td>ASTM E119 - 05a</td>
<td>Unsymmetrical Load-Bearing Wall Fire Tests of Building Construction &amp; Materials</td>
</tr>
<tr>
<td>Transverse Load Testing ICC-ES AC04 Includes Simulated Door &amp; Window Openings</td>
<td>Standard Test method to evaluate the deflection, flexural strength and stiffness of the wall panels to simulate wind and structural loads.</td>
</tr>
<tr>
<td>Axial Load Testing ICC-ES AC04</td>
<td>Standard Test method to evaluate the axial compression strength of the wall panels with a vertical load applied.</td>
</tr>
<tr>
<td>Concentrated Load Testing ICC-ES AC04</td>
<td>Standard Test method to evaluate the punching shear resistance of the panel facing when used as a roof or floor panel.</td>
</tr>
<tr>
<td>Bond Strength Testing ICC-ES AC04</td>
<td>Standard Test method to determine the adhesive bond strength between the EPS core and the metal facings on the PFF composite structural insulated panel.</td>
</tr>
<tr>
<td>Core Shear Modulus ICC-ES AC 04</td>
<td>Standard Test method to determine the shear strength properties between the EPS core and the metal facings on the PFF composite structural insulated panel.</td>
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<tr>
<td>Fastener Withdrawal Tests ICC-ES AC04</td>
<td>Standard Test method to determine the resistance to direct withdrawal of screws from the PFF composite structural insulated panel.</td>
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<tr>
<td>Connection Load Test ICC-ES AC04</td>
<td>Standard Test method to simulate the connection of a PFF roof panel to PFF wall panel and then evaluate the uplift strength of the connection.</td>
</tr>
<tr>
<td>Tensile Test of Steel Coupons ASTM A 370 - 05</td>
<td>Standard Test method to determine and confirm the tensile &amp; yield strength of the Galvalume steel materials which are used as facings on the PFF structural insulated panel.</td>
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### Additional Comments

- The EPS foam core used in our panel is treated with a Borate additive to resist termites.
- A standard 24 month warranty covering panel defects and workmanship is available.
- PFF recycles 100% of all the foam & metal waste produced during our manufacturing process.
- Structural testing of our panel was completed in 2009 at Architectural Testing, Inc. in York, PA.
- Testing of panels was done in accordance with ICC-ES AC04 criteria ICC-ES AC04.
- PFF is currently working through the Miami-Dade Certification program, no known completion date is available at this time.

You will get the highest standard of performance with PFF Precision Buildings!
PFF’s SIPs Surpass Wind-Borne Debris Impact Testing Requirements

Heavy Missile Impact Testing results surpassed the requirements for all required structures as per the State of Florida Impact Requirements for Educational Facilities SS-TD-12-99 and ASTM E-1886 Wind Cycling and ASTM E-1996 Impact by Wind-borne Debris in Hurricanes including water resistance AFTER heavy missile impact and hurricane wind cycling.

PFF SIPs — THE SMART CHOICE!
PFF’s mission is to provide safe, affordable and sustainable housing for populations throughout the world.

Whether responding to a disaster or supplying eco-friendly buildings, all structural panels are pre-designed and constructed in the factory and assembled on site. The PFF technology allows for building with strength and speed. In addition, we train unskilled local labor for installations. The PFF effort to use local labor in the construction process is a large benefit for government and corporate clients, as jobs are created for their constituents.

During the course of restoring the Florida International University (FIU) Solar House, which was demonstrated in Washington DC in 2005, we observed first hand the PFF product in conjunction with ESPs’ Planet Earth Water Purification & Delivery System. We are aware that these products have since been incorporated in the design and construction of one of the solar-powered 600 sq. ft. building sent to Haiti for a medical center in Sean Penn’s J/P HRO camp and another doctor’s workroom for “No Boundaries” Prosthetic Organization which provides prosthetics for children hurt in the earthquake. These PFF sustainable units will definitely aid the Haitian people in their rebuilding efforts, as units built with the product can be constructed quickly with local labor and are very safe against the elements. It therefore accomplishes multiple purposes as it employs the currently underemployed and unemployed and it provides safe and permanent housing units when adopted widely.”

DR. YOUNG TAO
Professor & Associate Dean
Academic Affairs & Undergraduate Studies
Florida International University