



“Worldwide Supplier of Structural Insulated Panels”

SIP Supply, LLC / CommercialSIPs.com

P.O. Box 671032, Marietta, GA 30066 Consumer Web: SIPSupply.com

SIP Semantics, Evolution Explained

By Frank Baker

Is a Structural Insulated Panel?:

1. A Stress-Skin?
2. A Foam Core Panel?
3. A Curtain Wall Panel?
4. Insulated?
5. Un-insulated?
6. Structural?
7. Non-Structural?
8. All of the above?
9. None of the above?
10. Some of the above?

The Structural Insulated Panel or SIP is a term that was a natural contraction of names used to describe a family of building components that includes sandwich panels and stressed-skin panels, which can utilize a variety of skins and cores.

The long history of SIPs has been laced with many changes. The basic concept of a SIP is one of doing much more with less. The basic engineering premise behind SIPs is the idea of using less material to produce a building component that is at once relatively light and tremendously strong. The early years of SIP development preceded the common use of insulation in buildings and the advent of rigid foam insulations. Prior to the use of rigid insulation as the core and shear transfer media for a panel, the space between the skins of a panel were made of other materials depending on the application, such as cardboard, egg crate style fillers and lumber. One of the early applications and still in common use today was the production of hollow core doors using thin wood veneers and egg crate style wood fiber centers. In higher stress applications like building panels these early panels used lumber as the centers to secure the skins against buckling and transfer shear stresses between the skins. Connections between the skins and lumber were through nails, screws and adhesives. These panels did not normally contain insulating material, but by the nature of the trapped air space and air tightness, they undoubtedly performed better thermally than stud frame construction. For this reason one might argue that these early building panels were SIPs.



“Worldwide Supplier of Structural Insulated Panels”

SIP Supply, LLC / CommercialSIPs.com

P.O. Box 671032, Marietta, GA 30066 Consumer Web: SIPSupply.com

New insulation material technology in the form of rigid foam plastic and fiberglass found their way into the market place after World War II. Fiberglass offered greater insulating ability than a trapped air space and could be used in a SIP built with lumber. This configuration could certainly qualify as a Structural Insulated Panel. The rigid foam insulations provided a new option to the core of a panel. It was discovered that simply laminating the rigid foam between skins produced a thermally and structurally superior building panel without the reliance on lumber in the core. The American Plywood Association and others did extensive engineering and testing of these two basic types of panels in the 1950ís and 60ís. The design characteristics of panels using both lumber and foam cores were mathematically modeled and the equations tested to verify their accuracy in predicting performance with various types of skins and cores under different load conditions.

This research led to the publication of two key documents, which detailed the methodology for calculating the performance of the two basic types of panels. Terminology was created and defined in these publications to differentiate between the two types of panels. Panels, which relied on a foam core sandwiched between facings for their structural performance, were defined as Sandwich Panels. Panels, which relied on lumber materials instead of foam in the core of the panel, were defined as Stressed-Skin Panels. The APA published these definitions, details and mathematical formulas in two publications:

PDS (Plywood Design Specification) Supplement Three: Design and Fabrication of Plywood Stressed-Skin Panels.

PDS (Plywood Design Specification) Supplement Four: Design and Fabrication of Plywood Sandwich Panels.

In the 1960s APA succeeded in getting these Specifications adopted by the Model Building Code Agencies. Supplement Three was updated in August of 1990 and Supplement Four in March of 1990 and these revisions were adopted by the three Model Codes.

Is a Sandwich Panel a SIP? Today’s SIP is most commonly known as a laminate of oriented strand board (OSB) skins and rigid plastic foam core insulation. This type of panel correctly referred to, as a sandwich panel is certainly a SIP.

Answer: Yes, Always.



“Worldwide Supplier of Structural Insulated Panels”

SIP Supply, LLC / CommercialSIPs.com

P.O. Box 671032, Marietta, GA 30066 Consumer Web: SIPSupply.com

Is a stressed-skin panel a SIP? If the stressed-skin panel does not contain insulation it could not be correctly referred to as structural insulated panel but only as a structural panel or SP. If it were insulated with fiberglass or foam it could be correctly referred to as a SIP.

Answer: No in most cases, but yes in some.

Is a Foam Core Panel A SIP? Foam Core Panel is a non-specific term in reference to the Building Codes. It has commonly been used in describing a sandwich panel, but confuses the purer definitions APA established years ago. Strictly speaking a stressed-skin panel could be insulated with rigid foam. If this were done would it then qualify as a Foam Core Panel? In my opinion this term should be discarded.

Answer: Yes, but let's not use the term again.

Is a SIP structural? By their nature SIPs are structural. They are intended to carry loads. If they were not intended to carry loads there would be little need to securely laminate a sandwich panel or nail a stressed-skin panel. Sandwich panels and stressed-skin panels as types of SIPs carry and transfer loads in similar fashions. In recent years it has become a poor practice to refer to panels attached to other structural systems such as steel framing, timber framing, etc, as non-structural panels. Panels used in these applications are also commonly referred to as curtain wall panels because they close these structures with a curtain like affect. This is a poor way refer to a SIP in my opinion, since it falsely implies that the panels attached to one of these structures would to blow around in a curtain like fashion. We expect and need the SIPs used in these applications to be rigid structural members. They must resist significant wind loads when used on walls and support snow, wind and dead loads on roof applications. In most cases they also contribute significant racking diaphragm stiffness to the structural framework. It is hard to imagine how we could refer to these panels as non-structural curtains. The only type of load panels in these applications do not see is axial load in walls. Even in walls however we expect the panels to hold windows, doors and often other structural components such as beams.

Answer: Yes, Always



“Worldwide Supplier of Structural Insulated Panels”

SIP Supply, LLC / CommercialSIPs.com

P.O. Box 671032, Marietta, GA 30066 Consumer Web: SIPSupply.com

Is a SIP Non-Structural?

Answer? Never

Language and terms are ever changing. But our ability to communicate precisely without confusion is founded in the understanding of the evolution of these terms and definitions. I hope this will help us all in the industry to better understand the terms we use, avoid confusion in the marketplace and maybe even avoid liability.

SIP Supply provides the highest quality structural insulated panel in the marketplace at this time. Utilizing the insulation properties of polyurethane as the inner core, our framed and foamed in place assembly allows for the tightest seals and quality control. Our technology used in the manufacturing process allows for mass production of panels. Due to our volume buying power and production, we are able to deliver panels at or below the competition.