



GENERAL

What are the advantages of panelized construction over conventionally framed buildings?

Panelized homes, made with Structurewall™ insulated panels, can be erected very quickly. They provide tremendous interior design flexibility. They also produce a stronger wall than conventional framing of equal thickness, and they are extremely energy efficient.

What holds the house up since standard framing lumber is not used?

Structural support is provided by the panel skins. Structural insulated panels use less wood than conventional framing, and it is optimally placed (as the panel skins), resulting in a wall assembly more than twice as strong as a conventional 2x4 wall. The 4-footwide panels, up to 24 feet long, are securely held together with plywood "splines" in both wall and roof systems.

What are the disadvantages to this type of panelized construction?

Many builders are not familiar with erection of the shell and techniques used for finishing. Fortunately, shell erection can be handled using standard carpentry techniques by a qualified local contractor or by an experienced crew recommended by Winter Panel. Techniques required for construction are very easy to master, and are covered in the Complete Guide to Building with Winter Panels.

Is there an advantage to the 4-1/2" panel thickness?

Yes. This construction system provides the highest level of energy efficiency for the given wall system available anywhere. You get more living space than in any other comparatively insulated house with the same outside dimensions. Also, windows and doors can easily be installed with little or no modification of the jamb thickness. Use of 5-1/2" or 6-1/2" panels for the roof provide a smaller profile and greater efficiency than a conventionally framed structure.

What is the interior layout like in a Winter Panel Home?

Because the building shell provides most of the load-carrying strength of the house, there is tremendous flexibility of interior design. Use a Winter Panel design, plan the layout yourself, or work with your architect, builder, or Winter Panel designer to provide exactly what you need. Unlike many home designs, the structure itself does not constrain your design flexibility.

Structural Insulated Panels (SIPs)

What are SIPs ?

SIPs panels are insulated building panels which have a core of rigid insulation between an exterior and interior skin. The Structurewall™ panels used in Winter Panel homes are manufactured by Winter Panel and have a 3-5/8" core of polyurethane foam insulation, with oriented strand board (OSB) skins on both the interior and exterior. The two skins carry all the loading stress of the structure, while the foam core keeps the two skins aligned. Other thicknesses are available as well as Expanded Polystyrene (EPS) and Extruded Polystyrene (XPS) cores.

What skins are used on the panels?

Structurewall panels have an exterior grade of structural OSB on both the exterior and interior.

How are panels made?

Urethane panels are made in a continuous lamination process in which the foam is injected between the OSB skins and allowed to expand and bond to the OSB under carefully controlled conditions. EPS and XPS foam cores are bonded to the skins with an adhesive and cured under pressure in a vacuum process.

Why is OSB used instead of plywood?

For a number of reasons. First, OSB is more stable than plywood, particularly in high moisture conditions; delamination and linear expansion are much less likely to occur. Second, OSB is available in much longer lengths (up to 24'). Third, it is less expensive than plywood, producing a more affordable finished product.

Are there any problems with dimensional stability of panels?

Panels are quite stable, but will expand somewhat under high moisture and temperature conditions. At 160°F and 100% relative humidity, panels will expand 5% over 24 hours. Lowering the temperature to -20°F will result in a .15% volume decrease over 24 hours.

What is the R-value of the panel?

R-value's range from R-15 thru R-38_(this includes the R-value of the panel core and panel skins like OSB and drywall) and is dependent upon the foam core type and thickness..

Are these "aged" R-values?

Yes, they are conservative values, aged a minimum of twelve months.

Why isn't there a vapor barrier in the panel?

The panel itself serves as the vapor barrier. Most model building codes require a vapor barrier with a perm rating of 1 or less. The perm rating of our panels is less than 1. Because there are no voids in the panel where moisture could condense, moisture problems are not a concern. Panels will absorb and release some moisture on a seasonal basis, just as the wood in a log cabin does, but there are no harmful effects of this cycling.

Do I need to add a vapor barrier or use a vapor-retardant paint?

No vapor barrier is required with the panel. The only place where moisture migration could conceivably be a concern is at panel joints. Joints between panels are sealed during installation to prevent moisture migration.

Do I need to allow an air space for ventilation on the roof if I'm using panels?

Ventilation is usually only required on roof systems where moisture could condense in the roof system, or where high temperatures could damage the insulation. Neither of these is a concern with our panels. However Winter Panel does recommend the use of a "cold roof" when installing roofing. Details can be found in the Winter Panel construction manual.

With a rigid shingle roof, such as wood shakes, tile or slate, horizontal strapping is generally recommended (follow roofing manufacturer's recommendations).

Do Winter Panel SIPs carry a warranty?

Yes, Winter Panel SIPs carry a ten-year limited warranty covering the structural panels, provided the SIPs system is erected in accordance with company guidelines. For complete warranty information, contact the company.

ENVIRONMENTAL AND HEALTH CONCERNS**What kind of foam is used in the panel?**

Polyurethane, developed for high R-value, structural strength and fire safety. Expanded or Extruded polystyrene can be substituted as a less expensive but lower R-value options.

Is there any out-gassing from the foam? What kind of gas is it, and do I need to worry about it?

245fs is used as the blowing agent for the foam. A very small amount will outgas from the foam over time, but the gas is considered completely harmless.

Is there any formaldehyde in the foam? No.**What about formaldehyde out-gassing from the Oriented Strand Board?**

Exterior grade OSB such as that used in Structurewall panels is made with phenol-based resins that do not release significant amounts of formaldehyde gas. Urea formaldehyde resins, on the other hand, which are used in interior grade particle board products, release far more formaldehyde gas, and it is these products — not OSB — that have heightened concerns over formaldehyde in houses. The Federal Government requires that warnings be put on products that may release formaldehyde; our products do not require that warning.

What happens when the panels burn?

When the panels burn, a number of gasses are given off. Some of these are dangerous, including carbon monoxide and certain hydrocarbons. The exact composition of combustion products depends on the fire conditions (how much oxygen is available, etc.). You should assume that the gasses given off by all SIPs are dangerous. The toxicity of gasses given off from our panels during combustion is about the same as that from white oak or Douglas fir.

A key advantage of urethane foam is that the foam does not melt. Urethane is a "thermo-set" plastic and will retain its structural integrity until consumed by fire (like wood). Other types of foam melt with temperatures as low as 170°F, and can contribute tremendous quantities of fuel to a fire very rapidly. Additional information on fire safety of panels is available from Winter Panel.

What is the wall finish fire rating of Structurewall™ panels?

ASTM testing by an independent laboratory showed the wall finish rating of Structurewall panels to be greater than 15 minutes with drywall attached. Complete information on wall and roof finish ratings is available from Winter Panel.

What are the building code requirements for panels relative to fire?

Building and fire codes vary from place to place. Usually, a 15-minute finish rating is required for light construction. Structurewall panels, with an interior layer of 1/2" drywall, exceed this requirement substantially.

Do I need an air-to-air heat exchanger?

Air-to-air heat exchangers or other types of mechanical ventilation are recommended in all tight houses including those enclosed by SIPs panels. Winter Panel recommends that air-to-air heat exchangers be incorporated into all SIPs homes.

ERECTION OF THE SHELL**Who takes care of erecting a Winter Panel SIPs shell?**

General contractors or SIPs installation crews are responsible for shell erection. Winter Panel can recommend experienced SIPs installers in many regions.

What are the foundation requirements?

The buyer is responsible for having the foundation installed to the specifications provided by Winter Panel. A Winter Panel home can be built on a slab-on-grade foundation or on frost walls over a full basement or crawl space. It is extremely important, however, that the foundation is built to close tolerances. Because of the accuracy of the supplied components, even slight inaccuracies in foundation level or being out of square can result in problems with shell erection.

How long does it take to erect a Winter Panel shell?

The complete shell, including walls, sub-floors and roof, can usually be erected in one week by a skilled crew. With large houses, or more involved custom designs, erection will take longer.

What happens if it rains while the shell is being erected?

Structurewall panels are not damaged by rain. However, long-term exposure to water will cause the OSB at the panel edges to swell. After erection of the shell, these swollen edges should be sanded down with a belt or disk sander.

How far along will the shell be when the SIPs contractor or installation crew leaves the site?

The shell will be fully erected and ready for window and door installation, roofing, siding and interior finish.

FINISHING A WINTER PANEL HOME**What skills are required for finishing a Winter Panel home?**

General carpentry skills are all that you will need to finish a Winter Panel home. Skilled homeowners can do most of the work themselves, subcontracting out work requiring specialized skills, such as electrical and plumbing work.

How is the roof finished?

With asphalt and fiberglass shingles and metal roofing, a cold roof system is recommended. With some types of roofing, such as wood shakes and slate shingles, horizontal strapping is required.

What kind of roof trim can I use with Winter Panel SIPs?

The outer roof edge, both along eaves and gable ends, will require two-by blocking to be installed. You can add any trim to this you wish to meet your design preferences. At the eaves, some people choose full-return horizontal soffits with ornate fascia trim, while others choose simple sloped soffits, nailed directly to the panel overhang.

Is exterior siding applied directly to the panel skin?

Felt paper or other drainage material should be used between the panels and siding. An air barrier such as Tyvek™ or Typar™ may be used, but it is not required. In most situations, especially such as with wide board-and-batten siding, wood strapping should be attached to the wall first, then the siding secured to the strapping.

How should siding be applied?

Horizontal siding is nailed directly to the panel wall passing through the air and moisture drainage systems. Keep nails at least 6" from splines to avoid rippling of the siding. With shingles, you may nail into strapping without worry. With vertical board-and-batten siding, horizontal strapping is recommended. Use 6d galvanized or stainless steel nails for clapboards and 8d galvanized or stainless steel nails for board-and-batten.

Are windows and doors difficult to install?

No. Windows and doors are very easy to install in a Winter Panel home. Units are set into the rough openings (which were built into the shell) and shimmed to level, as per instructions provided by the window and door manufacturers. Then the perimeters are sealed with low-expanding foam sealant, resulting in an extremely energy-efficient installation. Care must be used when foaming around windows and doors so as not to swell the casings.

How are interior walls installed?

Interior partition walls are generally constructed of 2x4s and sheathed with drywall as in conventional frame construction. Where an interior partition wall meets an exterior wall, the edge stud is nailed or screwed into the OSB skin of the panel.

How do you run wiring in panels?

There are a number of options for running electrical wiring in a Winter Panel home. Horizontal wiring runs are usually carried in the basement, with short upward extensions for outlets made in the Structurewall panels. Some electricians push the wire through the foam core of the panel, while others make a vertical rout through the inner OSB skin from the outlet down to the floor level and push the wire in before drywall is installed. Other options include surface-mounted wiring and wiring concealed in a baseboard raceway. Winter Panel has a technical sheet available on wiring details.

How are electrical boxes attached to panels?

The boxes are cut into the wall and either nailed to splines or secured to the OSB or drywall with "Madison" straps.

How do you run plumbing in a Winter Panel Home?

There will be almost no differences between plumbing a Winter Panel home and plumbing a conventionally framed house. Plumbing runs should be kept in interior (conventionally framed) partition walls or in specially constructed plumbing chases.

How are walls finished in a Winter Panel Home?

Walls are usually finished with drywall on the interior face. On SIPs walls, drywall is installed directly over the OSB surface of panels, applied either vertically or horizontally. Some builders use construction adhesive in applying drywall to the panels, enabling them to use fewer fasteners. On interior partition walls (which are framed conventionally), drywall is installed in a standard manner, nailing or screwing drywall to the studs. With cathedral ceilings, some builders prefer to substitute Winter Panel Pineclad™ panels, which have an interior facing of T&G pine.

How are kitchen cabinets installed?

Kitchen cabinets are very easy to install in Winter Panel homes. Along exterior walls, cabinets are screwed directly into the OSB skin of the panels. Because a single layer of OSB is not as thick as a stud, you should use a few more fasteners. Screws are recommended for cabinet attachment. For the strongest attachment, cabinets should be secured directly to the OSB before drywall is installed but it is possible to mount the cabinets to walls after drywall has been installed. On interior (non-SIPs) walls cabinets are installed conventionally by screwing or bolting them into studs.

What is the best type of heating system for a Winter Panel SIPs home?

Any type of heating system can be used. Talk to your heating contractor or general contractor for recommendations.

Can I heat with wood?

Absolutely. Many people living in Winter Panel SIPs homes are able to provide all their heat with just one to two cords of firewood per year! With wood heat, a source of outside combustion air is recommended.

Do I need to worry about insects with Winter Panel SIPs?

On occasion, carpenter ants will take up residence in the Structurewall™ panels of a Winter Panel Home. To protect your house from possible ant infestations, Winter Panel recommends that you have your house protected by a certified pest control professional both during construction and periodically thereafter.

FOR MORE INFORMATION

For additional information on Winter Panel prepackaged or custom house designs and details on shell erection and finishing contact the company or visit us on the web at www.winterpanel.com



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