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Understanding the Art of UltraFrame

THE SYSTEM

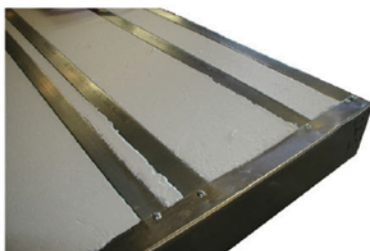
UltraFrame is a structurally insulated metal stud panel. It is comprised of Graphite Expanded Polystyrene (GPS) and thermal structural metal studs. The UltraFrame insulated structural panel was created after completing ten years of alternative building material system analysis. Engineers, architects, builders, tradesmen, and inspectors were instrumental in the overall design of UltraFrame, while accounting for these eight criterion satisfied by the UltraFrame System:

- Insulation
- Stud
- Configuration
- Assembly
- Engineering
- Environment
- Longevity
- Cost



INSULATION

Our evaluators experimented with Fiberglass, Cellulose, Icynene, Urethane, and Graphite Polystyrene (GPS) insulation systems. Measuring the R-Values, mold and water resistance, long-term performance, cost, and environmental impact, they determined that GPS was the best solution for the insulation system of UltraFrame. Graphite Polystyrene is a closed-cell, lightweight, rigid plastic foam. The modified grade of GPS that Wally Walls selected contains a fire retardant to decrease the potential of fire spread from a small flame source. The grade of bead has been designed to meet domestic and international building codes.

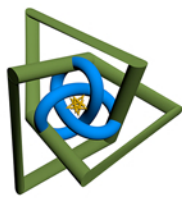


GRAPHITE POLYSTYRENE (GPS)

Type	R-Value per Inch	Capacity to Recycle	Resistance to Mold	Resistance to Water
Graphite Polystyrene	5.0	Yes	Yes	Yes
Fiberglass	2.1-3.3	No	No	No
Cellulose	3	Yes	No	No
Icynene	4.5	No	Yes	Yes
Urethane	5.0-8.0	No	Yes	Yes

Outstanding Properties

- Excellent Mechanical Properties - GPS provides resistance in compression and a capacity for dampening shocks caused by seismic and hurricane force winds.
- Insensitivity to Water - GPS will not warp, twist, rot, delaminate, or break down.
- Capacity to Recycle - The very nature of polystyrene as a thermoplastic allows it to be continuously melted and reformed making GPS a highly recyclable product.
- Biodegradability - GPS will not biodegrade allowing a building to perform with the benefits of solid mass insulation indefinitely.
- Inorganic - GPS contains no food value for termites, ants, or other insects. Mold is also not attracted to GPS.
- Waste to Energy - Graphite Polystyrene, when converted in state-of-the-art incineration systems, will yield 17,000 to 18,000 BTU of energy per pound, which is more than coal. Graphite Polystyrene consists solely of hydrogen and carbon. Its complete combustion yields only carbon dioxide and water vapor. In fact, GPS may well be the cleanest incineration source of energy. The are no chlorofluorocarbons (CFC's), HCFC's, or Formaldehydes
- Contaminants - GPS contains no chlorofluorocarbons (CFC's), HCFC's, or Formaldehydes.



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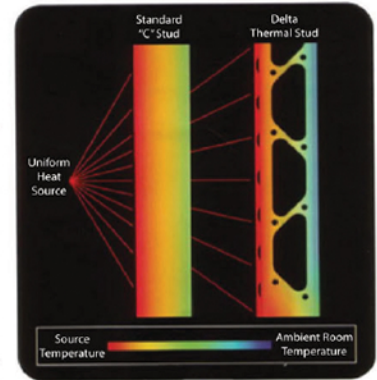
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STUD

Our engineers experimented with various forms of metal stud framing and consulted globally with engineering and manufacturing firms to determine the best approach for creating a structural system that limited thermal bridging and removed the dependency of GPS as the primary structural element for UltraFrame. Ultimately, we chose a proprietary thermal stud metal framing system for its structural integrity, thermal performance, strength-to-weight ratio, and cost. The thermal stud provided an additional benefit by being tested by Underwriter Laboratory (UL) as the only stud to surpass the one-hour fire rating with single layer 5/8" gypsum wallboard. The thermal stud has also been designed to meet domestic and international building codes.

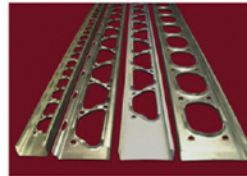
STRUCTURAL THERMAL PERFORMANCE

One of the most impressive advantages of the thermal stud is unparalleled thermal efficiency. As shown by this color temperature chart, when subjected to the same exterior wall heat source, the stud transfers much less heat to the interior wall side compared to the conventional "C" stud. The reason is simple: the large web openings reduce the path for heat transfer across the stud. Heat flow is confined to the slender ribs that cross the web.



In a typical eight foot section, the stud shows 75% less thermal transference than standard SSMA "C" studs. Encased in structural foam, the thermal and structural performance of through-wall metal stud framing is unmatched.

The thermal stud also delivers a higher Sound Transmission Coefficient (STC) rating due to the acoustic superiority of the profile.



Available Sizes and Gauges

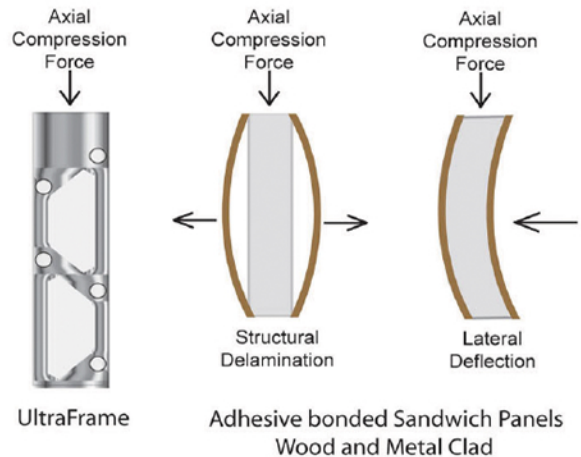
Sizes	Gauges / Mils
3-5/8"	20 / 33
4"	18 / 43
6"	16 / 54
8"	14 / 68
	12 / 97

CONFIGURATION

After ten years of alternative building system design and evaluation of various forms of alternative system concepts, designs, and configurations, the UltraFrame System emerged. Compared to Insulated Concrete Forms (ICFs), Straw Bale, "sandwich" Structural Insulated Panels (SIPs), and Aerated Concrete Block, our engineers determined that a composite panel comprised of GPS and through-wall structural studs would outperform other systems. Wally Walls avoided the "sandwich" metal and wood skin panel concept because of the limits to customization of plumbing and electrical services, risk of delamination, and most importantly, when exposed to fire, the sandwich panel insulation weakens causing structural failure and risk of injury. ICF construction was also avoided because of cost, construction limitations, and moisture creation in volatile climate zones. The through-wall structural framing approach with thermal studs was the best approach for developing a system to support multi-story construction. The approach allows any engineering firm to design without proprietary knowledge, and safety factors can be reduced resulting in less steel requirements and lower construction costs.

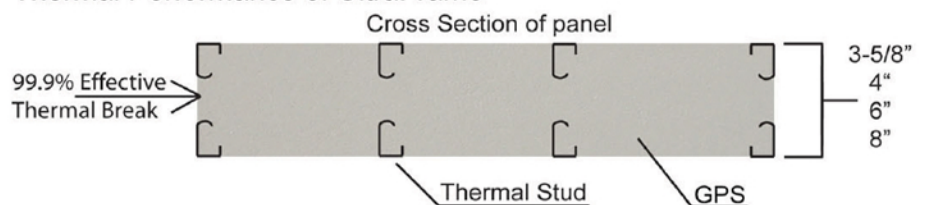
THROUGH-WALL STRUCTURAL DESIGN

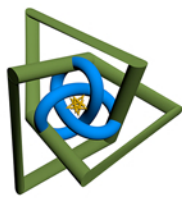
UltraFrame has developed a through-wall framing approach to metal stud Structural Insulated Panel (SIP) construction. The rationale to this approach is to provide additional structural protection where other systems stop. Ultra Frame has dual structural resistant technology. Structural GPS is injected into a structural panel encasing the thermal studs.



The result is the UltraFrame Building System that, when exposed to fire, wind, and seismic forces, will stand fast when others fail. The structural stud reinforcement of UltraFrame increases the overall performance of the panel well beyond the competition.

Thermal Performance of UltraFrame





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ASSEMBLY

Wally Walls has taken a simple solution to an on-site panelized framing approach. After ten years analyzing national and international installation instruction approaches, with concepts ranging from color designations, arrows, panel numbering, delivery approaches, and erection scenarios, Wally Walls has formulated a multilingual framing designation system. As a standard, all panels are installed from left to right, each panel is labeled alphabetically, and each wall panel is labeled in sequential order. Each panel also receives a "Top" / "Outside" marking to further support correct panel installation. The panel labeling system can be easily changed per project into any language and measurement standard to support local requirements.

ENGINEERING

Engineering was a major factor in the design of UltraFrame. Too many alternative framing systems were focused on being "unique," resulting in proprietary testing requirements. Furthermore, engineers were leery of designing structures that were not manufactured to standard construction practices, especially in high-risk zones.

Wally Walls took the approach with UltraFrame to remove the reliance on composite testing requirements and to focus on developing a building system that meets conventional building and engineering standards. UltraFrame has simply replaced conventional construction framing with an inorganic, highly energy-efficient building system that any engineer can design within any region of the world.

An engineer only needs to design a metal stud framed building with the appropriate gauge, size, and spacing. Wally Walls will panelize UltraFrame to the exact engineering specifications. This approach further reduces construction risks by delivering a pre-fabricated, pre-engineered building system for commercial and residential applications.

THE EASE OF ON-SITE CONSTRUCTION

Each UltraFrame panel has a 24 gauge trim metal on both top and bottom. This trim metal provides protection of the GPS during installation so that it will easily slide into the structural bottom and top track.

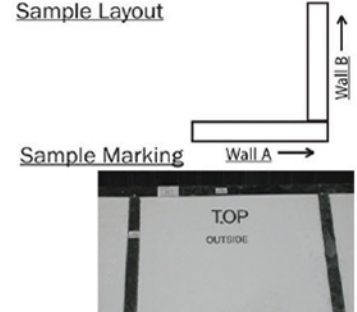
The approach to framing:

1. Set perimeter wall moisture sealer
2. Anchor structural bottom track
3. Mark track with panel widths
4. Set UltraFrame panels to each mark
5. Install structural top track
6. Screw or nail fasten track to panel studs

Panels are bundled per wall group and delivered on a flat bed trailer for easy off-loading.

Panels are lightweight and do not require the use of cranes or lifts. A typical panel weighs the same as a sheet of 3/4" plywood.

Sample Layout



Sample Label

Project Name: General Office Complex
 Project Number: TX-07-0231
 Fabrication Date: Oct - 14 - 2013

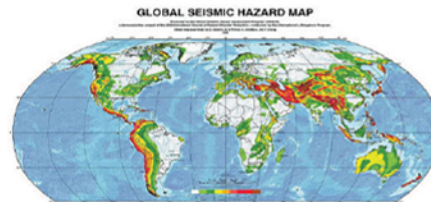
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ENGINEERED FOR GLOBAL USE

Hurricanes - Steel is recognized as one of the best building components to resist the devastating impacts of hurricane force winds and debris damage. UltraFrame can resist wind loads over 150 m.p.h. When flying debris strikes UltraFrame clad with sheet steel, the steel stops the debris while the GPS acts as a shock resistant product causing the debris to bounce off of the UltraFrame wall.

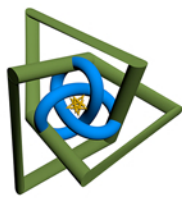
Seismic - Structural GPS in its formed state is a terrific shock absorbing product. Racking load test performed on GPS building products have proven to resist the damaging impacts of the highest Zone 4 seismic activities. The system memory of structural GPS can return a building after seismic exposure to 99% of original position.



Multi-Story - Cold formed steel has been approved for up to eight story construction unsupported by concrete or structural steel. Complimented with structural GPS, the encased studs have little to no opportunity to deform under normal stress, providing a greater safety factor. To support extreme shear loads, the UltraFrame panel can be externally X-Braced with engineered strapping sized to necessary gauges and widths.

Fire - The UL fire testing performed on the Delta Stud in early 2007 showed the best fire resistant results over any other prior tested metal stud. As a secondary step, the GPS in UltraFrame has also been modified with fire retardants and approved by UL for construction.

Strength-to-Weight Ratio - UltraFrame is one of the strongest building systems in the global market. Weighing less than 1/3 the weight of conventional lumber construction, a four foot by eight foot 20 gauge panel with studs at 16 inches on center weighs approximately 70 pounds and can support an ultimate axial load of over 36,000 pounds.



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ENVIRONMENT

Environmental protection is the core of Wally Walls' mission in designing building systems that support energy efficiency and sustainability. The focus was to develop a building system that was made of recycled products that can be recycled indefinitely. UltraFrame is prefabricated to eliminate jobsite waste. The System is designed with a zero-waste manufacturing approach and has been designed to reduce the carbon footprint of buildings supporting the Leadership in Energy and Environmental Design (LEED®) green building goals.

LONGEVITY

Wally Walls selected GPS and cold formed steel as the core building products for the simple fact that they are both considered highly recyclable and non-biodegradable. This means that GPS can last for hundreds to thousands of years in its solid state. The cold formed steel selected for UltraFrame has been galvanized and zinc coated for corrosion resistance, providing an average design life in the most corrosive global zones of 275 years. In temperate climates, the chosen steel can support over a 1200 year design life.

COST

As an investor in a building endeavour, it is important to determine the proper selection of your building materials to maximize your future return on investment. We must look beyond today and towards the future for buyers of homes and office buildings to maximize resale value. With the tremendous push towards "Green," energy-efficient, environmentally responsible building products, electing to construct today with traditional building materials is wasteful and out of touch with global policies. Traditional products are not competitive with future construction trends and will only limit resale value, much like the value today of a 1986 computer. On the other hand, UltraFrame has been developed to maximize both short and long-term returns.

PROTECTING OUR EARTH

Each year over four billion trees are harvested worldwide for construction purposes, equating to each 2000 sf residence consuming over one acre of virgin timberland. By building responsibly, one Wally Wall residence will require the use of only six recycled cars.

Wally Walls continues to monitor and refine new building technologies to maximize long-term environmental sustainability goals



that support the "greening" of the constructed world. The UltraFrame panel is one of many lasting technologies that you can expect to come from Wally Walls.

Wally Walls wants to be your partner in "Framing the Future". We understand the total life-cycle analysis to environmental product selection, and we strive to provide education to the marketplace on ever evolving trends.

BUILT FOR GENERATIONS

Maintenance - UltraFrame requires minimal to zero maintenance for the life of the System.

Resistance - UltraFrame is inorganic and therefore provides no food value for termites, wood ants, and other insects. Another benefit to the inorganic nature of UltraFrame is that it does not support mold growth or the transference of mold.

Water Damage - Long-term resistance to water damage, mold, and rot will protect your structure for generations. This makes UltraFrame one of the best building systems in the world for flood resistant construction. If a flood occurs, remove the interior veneer to flood level, let the wall system dry for 24 hours, then re-veneer the wall.

Fire - UltraFrame is treated with fire retardant qualifying the system for fire-rated assemblies. Furthermore, during fires, the treated GPS has a health safety 2.5 times that of white pine.

MAKING BUILDING GREEN AFFORDABLE

Building Envelope - A sealed thermal envelope building provides an investor many benefits making building green affordable. First, energy demands are 30-80% less, requiring less solar panel investment. Second, the buildings typically require 1/2 of the HVAC mechanical tonnage. Third, windows can be cost effective double pane low-e.

Jobsite Waste - UltraFrame is custom prefabricated to engineered specifications. The benefit is little to no waste on site. Builders have safer jobsites, generally with no need for dumpsters during framing stage, and rapid construction with limited noise pollution. UltraFrame will not warp, twist, or delaminate like other systems.

Rebates - Today, builders can qualify for up to a \$1250 per unit rebate on their federal taxes, and home owners can qualify for over \$500 rebate on their personal taxes by building with UltraFrame and other Wally Walls products.

Investments - UltraFrame is one of the most cost effective building systems that actually compete in cost to conventional building approaches. UltraFrame is 1/3th to 1/5th the cost of other comparable alternative building systems.

Insurance - Constructing projects in metal provides builders with discounts in Builder's Risk Insurance and Workers Compensation fees. Owners benefit with reduced permanent insurance rates that have annual increases less than traditional built structures.