

Tridipanel

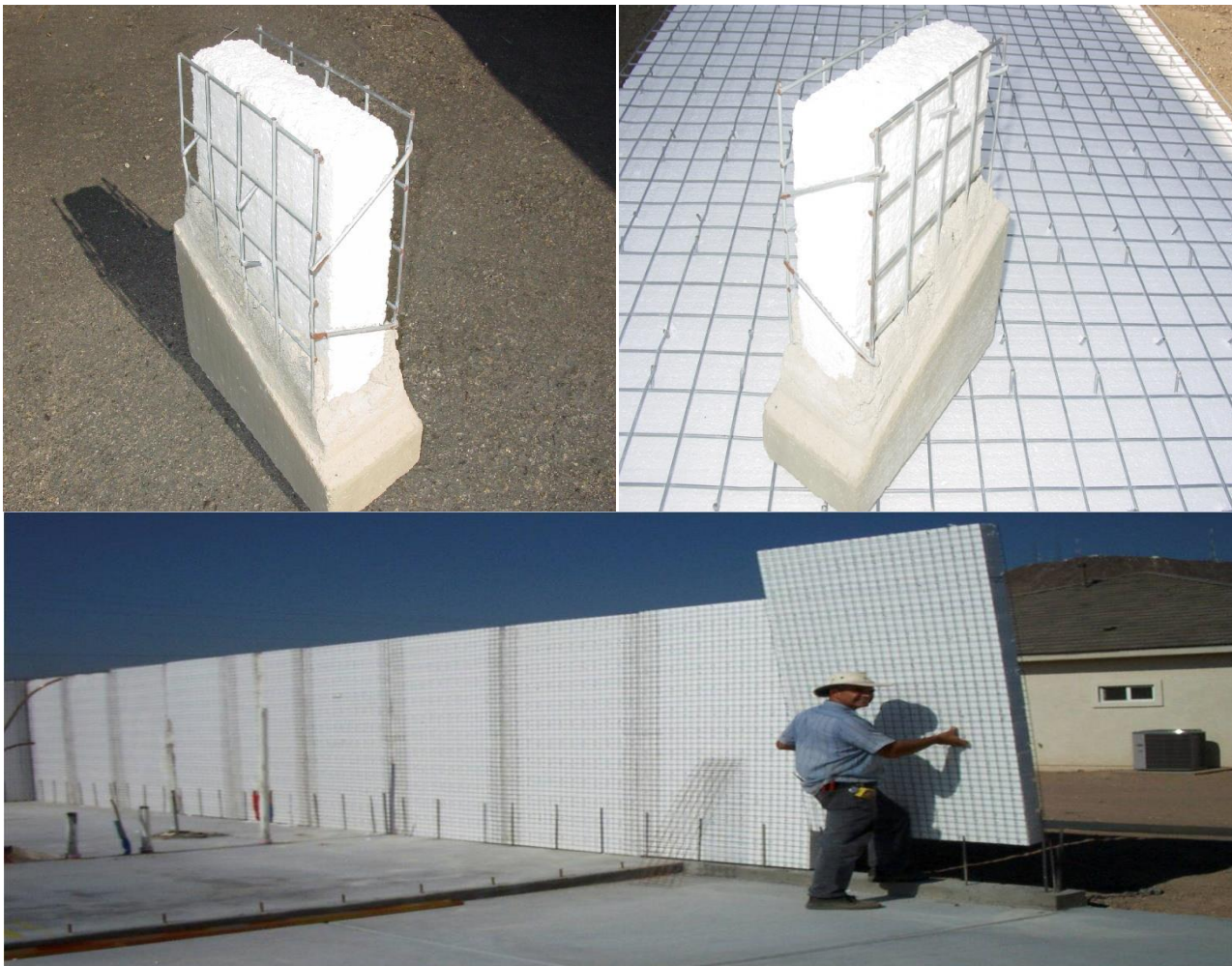
by Hadrian Tridi Systems

Alternative building system ideal for disaster-proof homes and structures

TRIDIPANEL – The Disaster Proof Way to Build - FAQ's

1. WHAT IS TRIDIPANEL? HOW IS IT MADE? WHAT IS IT MADE OF?

The Tridipanel is an insulated stay in place form. When Portland Cement is applied, by any method, the panel becomes a structural load bearing insulated wall system. The Tridipanel is an extremely strong prefabricated structural panel consisting of a super-insulated core of rigid expanded polystyrene sandwiched between two-engineered sheets of eleven-gauge steel welded wire fabric mesh. To complete the panel form process, a nine-gauge galvanized steel wire is pierced diagonally through the polystyrene core at offset angles (see top two pictures below) for superior strength and welded to each of the outer sheets of eleven-gauge steel welded wire mesh creating 12 steel trusses in each panel (see bottom picture below). Once these three elements are joined by EVG's state of the art manufacturing equipment, you have a THREE-DIMENSIONAL lightweight panel that is one of the strongest building materials ever manufactured.



- **2. WHAT ARE THE CHOICES OF CORE DENSITY AND STEEL MESH STYLES? (Dimensions of the panels widths below)**
- Wire gauges available in 12.5 gauge & 11 gauge (12.5 is a smaller diameter wire)
- Custom made panels to meet special requirements are available. (The diagonal truss wire is 9 gauge)

Foam Thickness			Wire to Wire		Minimum Wall Finish	
Size	Material	Density	Foam Size	Measurement	Foam Thickness	Concrete
2" core	Polystyrene	1LB	2"	3.25"	2"	4.5"
2.5" Core	Polystyrene	1LB	2.5"	3.75"	2.5"	5"
4" Core	Polystyrene	1LB	4"	5.25"	4"	6.5"
5" Core	Polystyrene	1LB	5"	6.25"	5"	7.5"

CONNECTING ACCESSORY MESH

Product	Size	Gauge	Square Feet
FLAT MESH	1' X 4'	12.5 GA	4
FLAT MESH	1' X 4'	11 GA	4
6" INSIDE CORNER ANGLES	1' X 4'	12.5 GA	4
6" INSIDE CORNER ANGLES	1' X 4'	11 GA	4
12" EXTERIOR CORNER ANGLES	2' X 4'	12.5 GA	8
12" EXTERIOR CORNER ANGLES	2' X 4'	11 GA	8
U-MESH ENDS	1.5' X 4'	12.5 GA	6
U-MESH ENDS	1.5' X 4'	11 GA	6

3. HOW IS TRIDIPANEL USED?

Tridipanel is used for numerous building applications replacing wood or metal-framed walls, masonry block walls or precast panels. Tridipanel may also be used for floor systems, ceilings and roofs. It is an excellent product for building privacy walls around a building structure and is being used by many landscape companies in place of masonry block. With handsome good looks and great flexibility, Tridipanel can be used in conjunction with all of the building trades.

4. HOW DOES TRIDIPANEL COMPARE IN COST TO OTHER BUILDING SYSTEMS?

The cost is dependent upon the design and finish of the project. Every structure is unique like a fingerprint; no two are alike. This makes analyzing the cost on a square foot basis difficult. Tridipanel is competitive with (2x6) stick framing or metal stud framing and is more competitive than block. Keep in mind Tridipanel is extremely versatile and can be used with any of the above systems. For return on investment, Tridipanel readily beats stick framing as well as most other building systems. The Tridipanel itself accounts for a fraction of the cost of a structure. The dollars you spend on the Tridipanel can be made up very quickly in energy savings alone. Over the life of the structure, the savings are quite staggering.

BENEFITS OF THE TRIDIPANEL SYSTEM:

A. Fast High Quality Construction/Time Saved

- **With the right building crew construction time decreased substantially**
- **Speedy occupancy**
- Saves money on construction loan dollars
- Enhanced resale and marketability value
- Reduces the need for heavy equipment on the job
- Fewer trades are on the job site.

B. Strength Durability & Greater Structural Integrity

- Virtually maintenance-free wall system
- Saves on long term replacement cost of structure
- Polystyrene panel or concrete will not decay
- Monolithic design for superior strength.

C. Safety Security

- Excellent performance in seismic zones (Earthquake Resistance)
- **Non-combustible structure**
- **Savings of 18% to 30% on fire insurance**
- Excellent high wind protection-up to 225mph
- Resistant to Insects, Termites, Rodents, Mold, Mildew, and Fungi

D. Pro Environment

- Green Building Product (Platinum rating)
- Energy Efficient
- Maximum Conservation of forestry products
- Structure durability offers value for generations and saves many Earth resources
- Dramatically reduces consumption of fossil fuels
- Reduces the size and cost of HVAC systems
- Saves 50 to 80% of utility costs on heating and cooling

E. Quality

- Comfort
- Design Flexibility
- Virtually eliminate outdoor noises
- Reduce drafts and wide temperature fluctuations
- Air quality virtually free of dust, pollen and allergens with use of an air exchanger
- Create an acoustical environment for full advantage of sophisticated sound systems and home theaters.

5. WHAT BUILDING CODES DOES TRIDIPANEL CONFORM WITH?

Tridipanel conforms to USA Code Approval - For full report, please visit evaluation website (www.icc-es.org) or call (800-423-6587 or 562-699-0543) and provide the following evaluation report number: **ESR-2435** (**THIS IS THE INDIVIDUAL REPORT NUMBER FOR TRIDIPANEL)

6. WHAT ARE THE INSULATION (R) VALUE FACTORS?

R-Value is a rating of the material resistance to thermal penetration. The higher the number the better the protection value. Many circumstances change the R-Value rating. R-Values change with the different thickness and density of the polystyrene panel core, various thickness of shotcrete applied to the interior and exterior as well as fluctuation of ambient temperatures

The Chart shown below shows the minimum R-Value Ratings you can expect using Tridipanel. A 2-pound Polystyrene Core will provide an additional 12% - 15% R-Rating. R-Values stated are within FTC guidelines.

2.5" 1-pound Polystyrene Core-R-Value 11.00
4.0" 1-pound Polystyrene Core-R-Value 18.00
5.0" 1-pound Polystyrene Core-R-Value 23.00

Remember to also consider Thermal Values in addition to R-Values. Our Thermal Values are extremely high (see chart below).

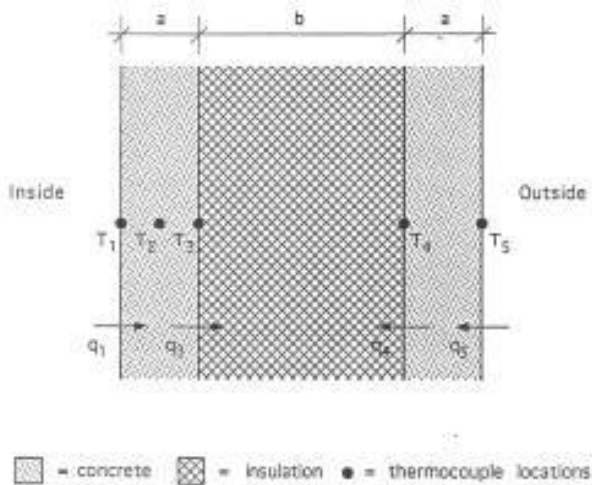


Figure 1

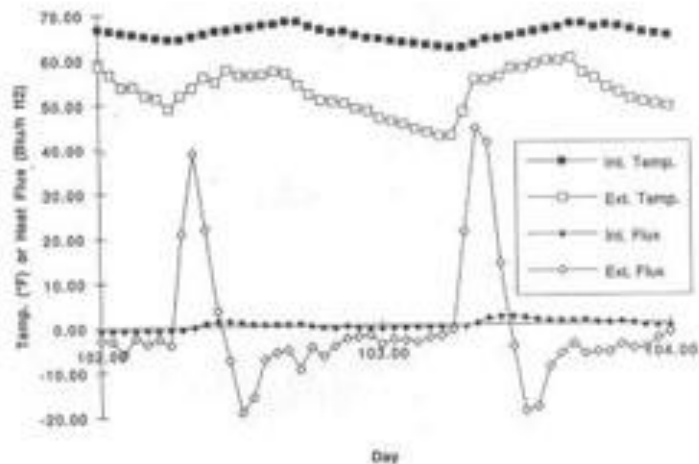


Figure 2

7. WHAT ABOUT THERMAL VALUE HEAT LOSS?

The Tridipanel System has been designed with maximum environmental comfort in mind. A wood structure simply cannot compare to the Tridipanel system that will keep you cooler in summer and warmer in winter. The modified expanded polystyrene core meets all VA, FHA and HUD thermal requirements.

TRIDIPANEL OFFERS VALUABLE SAVINGS: (See Figures 1 & 2)

1. No wood studs to transfer or conduct heat or cold through the exterior walls
2. The incorporation of minimum (3") density of shotcrete and variable thickness of polystyrene ranging from 2" through 5" offers an excellent thermal barrier.
3. Electrical and plumbing is through the interior side of the Tridipanel, so there are fewer wall penetrations, which keep thermal loss at a minimum.
4. Save 50% to 80% of heating and cooling costs.
5. Reduces size and cost of HVAC System.

8. WHAT IS THE (S.T.C.) SOUND TRANSMISSION COEFFICIENT?

The S.T.C. (Sound Transfer Coefficient) attenuation is excellent. The double shell configuration of the concrete plus polystyrene plus concrete sandwich minimizes sound transmissions.

Typical S.T.C. expected is as follows:

- 3" Concrete (1.5" each side) = $[0.1304 \times 38] + 43.48 [4.9552] + 43.48 = \text{S.T.C. of } 48.4352$
- 4" Concrete (2.0" each side) = $[0.1304 \times 50] + 43.48 [6.52] + 50.00 = \text{S.T.C. of } 50.0000$

Calculated from the PCI Pre-cast Manual

Note: We are currently working on a new polystyrene panel, which will have an integrated air pocket that will greatly improve this rating.

9. WHAT IS THE FIRE RATING OF TRIDIPANEL?

Tridipanel has the following fire-resistance ratings, (Ratings are valid for fire exposure from either side) Fire-rating is derived from the wire mesh gauge in combination with concrete thickness.

The insulation core Type I polystyrene foam demonstrated a flame-spread index of 25 or less and a smoke developed rating of 450 or less when tested in accordance with ASTM -E84.

The modified polystyrene core does not contain ozone-damaging chlorofluorocarbons (CFC's) in the manufacturing process or products.

- 2.5" EXP-Core with 1.50" Shotcrete each side = **1.5 Hours**
- 2.5" EXP-Core with 2.00" Shotcrete each side = **2.0 Hours**
- 2.5" EXP-Core with 3.1/8" Shotcrete each side = **4.0 Hours**

The fire rating increases with greater quantities of cement applied to each side. The Polystyrene core will not burn or melt.

10. HOW IS THE TRIDIPANEL SECURED INTO THE SLAB?

The rebar is embedded within the concrete slab. The panel is placed over the rebar, through the open space between the polystyrene core and the wire mesh. Once set, the rebar is fastened directly to the wire mesh by hand with tie wire. *It is critical the rebar be installed in a straight line so the rebar fits easily into the cavity between the polystyrene and the wire mesh. It is important to make sure the rebar is completely exposed so it becomes monolithically enclosed with the shotcrete or cement application.*

Should the building department or engineer require additional tie downs, the polystyrene core can be removed from the base of the panel. The panel is then set in place over the required tie-down and cemented in place.

Another option for placing the rebar in the concrete slab is to drill the concrete slab and pour epoxy in the cavity placing the rebar within its confines. Typically, the spacing of the rebar is (24") on center.

11. HOW IS A BOND BEAM MADE WITH TRIDIPANEL?

A bond beam is used to create large openings, or to strengthen large areas of ceiling or to help support roof structures. All bond beams created should be preapproved by a certified engineering firm. Removing the polystyrene core and installing rebar creates the bond beam. For further information please see instruction manual.

12. HOW ARE ELECTRICAL AND PLUMBING INSTALLED?

The installation of electrical or plumbing is achieved by removing the polystyrene core to create a cavity that electrical conduit or plumbing piping may be installed into. The polystyrene is approximately 3/4" off the wire mesh so that you have a space to install these products. If this opening needs to be greater the polystyrene core can be removed with a small keyhole saw or butane torch. The polystyrene will not burn it will shrink or melt leaving a cavity. The electrical or plumbing is then installed into the cavity. For further information please see instruction manual.

13. HOW ARE WINDOWS AND DOORS INSTALLED?

The window and door openings may be cut out with the use of three primary tools, a reciprocating saw, a set of 18" bolt cutters or pneumatic cutter, and a small hand saw to remove the polystyrene. It is recommended that a caulking sealant compatible with the polystyrene core be used to seal the jamb to the polystyrene core. For residential construction, wood jambs of treated material are then fitted into the openings (but for further fire protection it is advised to use commercial grade windows in prefinished concrete openings.) The windows and doors are then installed into the openings, as they would be into a typical masonry block structure (see our typical building details).

14. HOW DO YOU BUILD CURVED OR RADIUS WALLS WITH TRIDIPANEL?

You can build curved or radius walls by cutting the eleven gauge wires on one side of the panel. This will allow the panel to bend to the desired shape or radius. It is very important not to cut through the heavier nine-gauge truss wire so that wall strength and integrity remain intact. Stairs are built in a similar fashion.

15. HOW DOES TRIDIPANEL HOLD UP UNDER ADVERSE CONDITIONS OF HURRICANES, TORNADOES, EARTHQUAKES AND FIRES?

Tridipanel excelled in rigorous tests given by Mother Nature. For the last ten years, numerous homes have been constructed with the Tridipanel System on the East Coast, Caribbean and Gulf areas of Mexico and the United States. The homes were built to withstand hurricane force winds.

In Laboratory testing, the Tridipanel have been tested and will withstand wind loads of **226 miles per hour**. (Laboratory testing results available upon request.)

In the southwestern area of the United States, a two-story Tridipanel research complex jointly funded by the National Science Foundation, Southern California Edison, Inc. and the University of California withstood California's worst earthquakes in forty years struck twice a (6.5) and (6.9) Richter Scale. According to Dr. Philippe Cohen who resides at the site in the Mojave Desert, the area at one point was subjected to a continuous shake lasting over a full minute. The structure went through the quakes with zero structural effects. *Complete (Earthquake) structural testing report from certified engineering firm available on above upon request.*

Tridipanel is an ideal building product for structures in dry adverse climates where fire is always a constant threat. Areas which are heavily forested, high grass and brush, and other areas in Southern California during Santa Ana Wind Conditions, and other similar areas where structures may be prone to fires. We have had numerous fires in Southern California during Santa Ana Wind Conditions. A structure built with Tridipanel is **non- combustible and has a minimum 1.5-hour fire rating and a higher rating can easily be attained. Structures built with Tridipanel are virtually fire resistant.** *Full test report from certified engineering firm available upon request along with photos.*

16. WHAT IS THE WIND LOAD CAPACITY OF TRIDIPANEL?

The brief synopsis which follows, is from the test results report dated 1994 from Dade County, Miami Florida pertaining to the wind load capacity of Tridipanel. Three typical Tridipanel 4' wide and 10' high with 1-1/2" of shotcrete on each face were installed vertically, side-by-side, on a concrete slab, several inches in front of a rigid backup wall with space between the panels and the backup wall. The panels were tested per static-wind load test (PA202-94 manner of testing). Summary: The specimens tested herein were fully tested in accordance with the Dade County Building Code Compliance Office Protocols PA 201-94, PA 202-94 and PA 203-94. No failures occurred to the specimens nor their fastenings nor anchorage. The products described in this report comply with SFBC Sections 2309 and 2315. The panels tested at **126 lbs per Sq. Ft. pressure**, which represents over **225mph-wind factor**. *Please see wind load chart Exhibit 1.*

17. WHAT ARE THE LOAD BEARING CAPABILITIES?

The load bearing weights that a typical Tridipanel wall will support is amazing. The typical wood frame and metal frame wall cannot compare to Tridipanel strength. A typical tridipanel with 2.5" polystyrene core using eleven-gauge wire, 8' in height has been tested at a **structural load of over 100,000 lbs. per panel**. *Full load bearing chart available upon request.*

18. HOW ARE VARIOUS SHOTCRETE OR CEMENTS APPLIED?

There are many methods used to apply the concrete skin over the panel system. It is vital and necessary to apply cement over both surfaces. We have found that Stucco or Plastering contractors have excellent skills. They use a low velocity pump to apply a Portland Cement mixture, 3 parts sand to 1 part Portland Cement, sprayed or shot into the panel. This design mix can also be hand applied by trowel. Plastering contractors are very good at interior and exterior finishes as well. Other recommended methods are by licensed Shotcrete or Guniting contractors and possibly a plastering contractor for finish coats. This part of the operation is very specialized but there are options for all depending upon the desired finish. For architects with a special finish in mind we would like to mention that the architectural molds or metal trim could be incorporated into your design to achieve the desired finish. A few of the above-mentioned might be fry reglets, point to point reveals, parting screed etc. The versatility of numerous types of plaster finishes or stucco finishes will work on interior and/or exterior walls all of the newly created EIFS systems will also work.

19. WHAT IF YOU DON'T WANT STUCCO OR CONCRETE FOR A FINISH?

The Tridipanel system marries itself to all siding systems (brick, stone, tile, sheet metal, wood siding etc). Additional products you may apply over the finished panel are brick, mini-brick, stone, stone facing, tile - almost any type of finish your imagination can conceive will work but keep in mind the fire rating.

20. IS THE POLYSTYRENE WATERPROOF? IS THE FOAM WATERPROOF?

The polystyrene and the foam are one in the same. The polystyrene core is water-resistant. The ASTM test proved maximum water absorption of (2.5%) for (1lb density). E.P.S. is an inert, organic material. Polystyrene provides no nutritive value to plants, animals, or microorganisms. The polystyrene will not rot and is highly resistant to mildew. Aging has no effect upon the performance of the polystyrene E.P.S. is able to withstand the abuse of temperature cycling 180° assuring long term performance. Please refer to fire rating for flame spread information.

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WEBSITE: www.tridipanel.com