

# Shield™ Panel Technical Product Description

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## SYSTEM DESCRIPTION

The GUARDIAN STRUCTURAL TECHNOLOGIES building system is a fully engineered, highly insulated, structural building envelope designed to meet or exceed all major building codes. This building system integrates cold formed steel and expanded polystyrene (EPS), which provides complete wall or roof sub-systems. This technology has been in use for over 40 years and has provided unprecedented energy efficiency, tremendous design flexibility and a substantially stronger structure than conventional framing.

### Wall Panels:

- Individualized panel size and configuration dependent upon project design requirements
- Maximum overall wall panel size no greater than 10 feet x 38 feet for ease of shipment
- Wall panel thickness typically between 3-1/2 inches and 12 inches
- Used for both residential and commercial projects

### Curtain Walls:

- ◆ Exterior non-load-bearing cladding panels.
- ◆ Custom designed for wind loads attached to steel frame or masonry structures.
- ◆ Curtain wall panels can be supplied in vertical or horizontal sections up to 33 feet standard length.
- ◆ Curtain wall panel thickness from 3-1/2 inches to 12 inches.
- ◆ Thermal efficiency from R-16 to R-75.
- ◆ All openings (i.e. window, door and other) factory installed in wall panels as per architectural plans and specifications.
- ◆ Flexible custom attachment details dependent upon the project design requirements.
- ◆ Compatible with all finishes, exterior and interior.

### Load Bearing Exterior Walls:

- ◆ Can be designed to carry multiple floors.
- ◆ Eliminates some or all of the red iron structural framing.
- ◆ Shear wall structure can be integrated into the bearing wall panels as per architectural and engineering plans and specifications.
- ◆ Bearing wall panel thickness from 3-1/2 inches to 12 inches.
- ◆ Thermal efficiency from R-16 to R-50.
- ◆ All openings (i.e. window, door and other) factory installed in wall panels as per architectural plans and specifications.
- ◆ Flexible custom attachment details dependent upon project design requirements.
- ◆ Compatible with all finishes, exterior and interior.
- ◆ Has been tested to ASTM E119-08a fire test, and ASTM E2226 – 08 Standard Practice for Application of Hose Stream.

### Demising Walls and Corridor Walls:

- ◆ Can be designed to carry multiple floors
- ◆ Shear wall structure can be integrated into the bearing wall panels as per architectural and engineering plans and specifications.
- ◆ Bearing wall panel thickness from 3-1/2 inches to 12 inches.
- ◆ Can be classified as non-combustible.
- ◆ Wall panels sections up to 10 feet high x 38 feet long.
- ◆ Has been tested to ASTM E119-08a fire test, and ASTM E2226 – 08 Standard Practice for Application of Hose Stream.

# Shield™ Panel Technical Product Description Cont.

## Roof Panels:

- Individualized panel size and configuration dependent upon project design requirements.
- Maximum width is 4 feet and maximum length of 33 feet standard length.
- Roof panel thickness typically be between 7-1/4 inches and 12 inches standard, custom up to 15 inches.
- Used for both residential and commercial projects.
- Load Bearing Roof Panels:
  - ◆ Roof lines including gables, hips or flat.
  - ◆ Thermal efficiency from R-30 to R-75.
  - ◆ Roof panels can span from 8 feet to 15 feet @ live loading of 30 to 50 pounds per square feet as per the architectural and engineering plans and specifications.
  - ◆ Compatible with structural design using either red iron structural steel or bar joists.
  - ◆ Flexible custom attachment details dependent upon the project design requirements. Compatible with all finishes, exterior and interior.

## **GUARDIAN STRUCTURAL TECHNOLOGIES building system shall be composed of the following:**

- UL Certified modified expanded polystyrene (EPS) rigid insulation.
- Integrated into the EPS rigid insulation cold formed steel for structure, according to the architectural and engineering specifications for the project.
- The cold formed steel is integrated into the EPS rigid insulation opposed on the inside and outside to eliminate thermal bridging and produce structural composite super energy efficient wall and roof panels.
- The cold formed steel is screwed together with tie screws at a maximum of 3 feet apart.
- The wall panels are connected together with 1-1/2 inch x 1-1/2 inch 20 gauge (min.) galvanized steel angle or track fastened with TEK screws, on the top inside and out and on the bottom outside.
- The inside bottom angle or track of the wall panel is attached to the sub structure of the project as per the Architectural plans and specifications for the project. The outside bottom angle or track of the wall panel is attached to the sub structure of the project with tie downs as per the Architectural plans and specifications for the project. Structural headers for openings are integrated into the wall panels as per the Architectural drawing and specifications for the project.
- The roof panels are connected to the structural members of the structure by specially shaped 20-gauge (minimum) galvanized steel fastened with TEK screws.
- Dimensional and engineered lumber or steel structural members may be used to tie wall panels together and also provide structural support for GUARDIAN STRUCTURAL TECHNOLOGIES building system.
- Other components shall be custom designed as necessary to meet the project design as well as the structural requirements.

# Shield™ Panel Technical Product Description Cont.

## Performance Requirements:

### Load Criteria:

- Standard wall heights of 9 feet have a design wind load of up to 40 pounds per square foot.
- GUARDIAN STRUCTURAL TECHNOLOGIES building system can be engineered to wall heights of up to 20 feet and design wind load of up to 40 pounds per square foot.
- Standard wall heights of 9 feet have a design axial load of 2,250 pound per lineal foot.
- Standard roof panels have a design horizontal roof load of 40 pounds per square foot with appropriate purlin or ridge beams at 12 foot on center.
- GUARDIAN STRUCTURAL TECHNOLOGIES building system are customized to exact architectural and engineering drawings and specifications.

### Fire rating:

- Drywall of 1/2 inch or 5/8 inch provides the necessary rating as required by uniform building codes.
- ASTM-119 load bearing assembly is available.
- EPS rigid foam flame spread index (ASTM E84): 5-20. Test results from EPS manufacturer as per EPS specified.
- EPS rigid foam smoke development index (ASTM E84): 95-300. Test results from EPS manufacturer as per EPS specified.
- EPS rigid foam may ignite between 600-650°F. By comparison Douglas fir wood products ignite at approximately 500°F. EPS rigid foam contains 0.0833% of the combustibles present in wood products.

### STC sound rating:

- STC sound rating of up to 59 is available in an engineered assembly.

### Sound Absorption:

- @1,000 cps rating 0.36
- @2,000 cps rating 0.54
- @4,000 cps rating 0.38

### Thermal Efficiency:

- Insulation Core:
  - ◆ UL certified modified expanded polystyrene (EPS) Rigid insulation core shall have a minimum density of .90 pcf TYPE I complying with ASTM C578
- Thermal Resistance Values (R):
  - ◆ Wall Panel Thickness:
    - 9 ¼" 7 ¼" 6"
    - At 40° F 38 30 25
    - At 75° F 35 28 23
  - ◆ Roof Panel Thickness:
    - 12" 8" 6"
    - At 40° F 50 33 25
    - At 75° F 46 30 23