1. Product Name

Stadium Savers Geofoam Permanent Forming System

2. Manufacturer

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3. Product Description

Auditoriums offer unique challenges inherent in the hosting of entertainment, athletic, worship, educational and/or special events. These high traffic/large crowd venues demand tiered, unobstructed views. Stadium Savers’ solution is rugged, resilient, economical and long-lasting.

Geofoam Permanent Forming System is a versatile and cost-effective solution that can be installed in both new construction and retrofit applications.

Basic Use

The Geofoam Permanent Forming System is a comprehensive, engineered system for applying tiered seating to any facility. It can meet any design configuration and it has been has been installed in over 2300 auditoriums.

All components are engineered for quick assembly with a wide variety of accessories for different applications offered. The system can easily accommodate floor or riser mounted seats, curved or segmented risers, retrofits over sloped floors or any other unique challenge.

This stadium seating riser system also offers a straight-forward and simple approach, resulting in expedited construction times, reduced loss of revenue due to inactivity; yet it is flexible enough to work with any architectural design or any space.

Stadium Savers develops engineered shop drawings based on project configurations. Following placement of the foam, a metal riser system is installed on the front edge of each platform with these turn-key, pre-fabricated components.

Geofoam

The core of the system is precut, expanded polystyrene Geofoam to create the required design geometry. The lightweight blocks are easily placed in the field, serving as a substrate for the Stadium Savers metal forms and the ultimate pouring of concrete on the tiers.

Stadium Savers EPS Geofoam blocks are precut to the configuration of the stadium seating risers and stadium seating design layout. A standard block size is 48 × 96 inches (1219 × 2438 mm) by the riser height. If the riser height is 14 inches (356 mm), the 48 × 96 × 14 inch (1219 × 2438 × 356 mm) piece can easily be hand carried by a single individual. Each piece is marked so that the installer can easily determine the intended location. For instance, the first layer is labeled “A” and the first block is “1”, therefore the A-1 block is the first block to go into the back of the auditorium. Likewise, block B-1 would be the first block (installed in the back of the auditorium) in the second layer and so on.

Each 4 × 8 feet block is secured to the preceding layer with three gripper plates, which are 4 × 4 inches galvanized plates that have teeth pointing up and down. The plate is pressed into the lower block and the succeeding upper block is pressed onto the gripper plate. The gripper plates keep the blocks from shifting. In a typical auditorium, a crew of three or four laborers can easily assemble a complete studio in less than one day.

Geofoam Composition and Performance Data:

- Flame-spread index: 25 or less
- Smoke-developed indexes: 450 or less
- Minimum compressive resistance:
  at 1 percent deformation = 3.6 lb/in² (518 lb/ft²)
- Blocks contain no CFCs, HCFCs, HFCs or formaldehyde
Metal Risers

Stadium Savers metal risers provide the formwork for pouring concrete on top of the Geofoam and are available in a variety of dimensions, configurations and gauges to meet project requirements.

- **Standard risers**—used for floor-mounted seating; ideal for projects that do not require concrete behind its riser faces
- **Heavy duty risers**—used for riser-mounted seating, utilizing the same Geofoam base and heavier gauge metal risers to accept concrete up to eight-inches poured behind the riser face
- **Tall riser system (USP 7905060)**—recommended for projects involving riser-mounted seating and tiers over 14 inches (356 mm) tall, this patented riser system allows both standard and heavy duty riser systems to exceed the height limitations of metal risers that are only braced at the top and bottom; also includes additional center bracing points anchored to the Geofoam to provide solid formwork up to 60 inches in height
- **Riser options**—available with customized features to meet any project requirements; these include prefabricated opening for electrical boxes, punched holes for seating bolts and risers with nosings

Other Components

- **Support brackets and foam stakes**—provides solid bracing for the riser systems with mechanical slot connections between brackets and risers that do not require screws or special tools; brackets are available in different lengths and capacities; fabricated to interlock with slots in risers without the need for welds or other fasteners and they provide barbs for positive attachment to foam
- **Step forms**—allows stepped aisles to be poured at the same time as seating tiers, saving time and money during construction; forms are available in trapezoidal/special shape, as well as standard square configuration; sleeves to accept handrails can be included in step forms
- **Loop handrails**—can be specified to the required diameter and weight to meet any project requirements

**Note:** Consult with Stadium Savers' technical staff to provide the correct system to meet the needs for any project.

Composition and Materials

**EPS Geofoam**

Stadium Savers Geofoam is manufactured and labeled to meet the standard ASTM D6817; Standard Specification for Rigid Cellular Polystyrene Geofoam. The Stadium Savers system design includes full encapsulation of the Geofoam under concrete floors and within riser/wall construction with a continuous thermal barrier meeting IBC 2603.4 requirements. EPS Geofoam in the Stadium Savers system is used in greater thicknesses than foam plastics applied for general insulation uses. The thermal barrier protection behind the riser face recommended by Stadium Savers to exceed the requirements of IBC 2603.4 is one of the following:

- A minimum of 1.0 inch thick concrete or masonry, or
- A minimum of two layers of \( \frac{5}{8} \) inch thick, Type X gypsum wallboard, or
- Equivalent type of protection.

Stadium Savers Geofoam is available in different densities, with a minimum of 0.90 pounds per cubic foot (0.633 kg./cm\(^3\)) and its load-carrying capacities meet the requirements of ASTM D6817. The standard Stadium Savers specification for normal auditorium loading requirements is EPS15.

**Metal Risers**

Stadium Savers provides galvanneal risers that will service risers of varying heights for straight or radiused stadium design configurations. The risers are fitted with welded tabs to receive support brackets, also furnished by Stadium Savers.

All Stadium Savers risers and step forms are fabricated from ASTM A653 sheet steel with a40 galvanneal coating. Steel risers for straight rows are standard Z-shaped formed steel riser. Steel risers for curved rows are standard flat formed steel riser.
Both have standard lengths of 10 feet (254 mm), for foam brackets. Both are also available in plain or punched for seat bolts facings. The automotive-grade galvanneal coating is ready for finish paint.

**Standard Risers**

**Heavy Duty Risers**
Heavy duty risers for both straight and curved rows use 12 gauge steel. Riser heights range from 4–21 inches (102–533 mm).

**Tall Riser System (USP 7905060)**
Gauges for this system depend on the height and loading requirements and vary from 16 gauge to 12 gauge.

**Riser Options**
Risers are available with customized features to meet any project requirements. These include prefabricated openings for electrical boxes, punched holes for seating bolts and risers with nosings available only in straight configurations.

**Other Components**

**Step Forms**
Step forms are fabricated to the required dimensions from 16 gauge galvanneal steel.

**Loop Handrails**
Loop handrails are fabricated from ASTM A53 Pipe.

**Finishes**
Standard finish for exposed metal risers and parts is 40A galvanneal undercoat for field paint finishes. Risers and parts are also available in prime paint and G60 galvanized finishes.

**Note:** Galvanizing is recommended for moist environments such as pool viewing tiers.

**Benefits**
- Low cost
- Lightweight
- Easily formed
- Readily available
- Reduced construction time
- Can be adapted to any surface conditions
4. Technical Data

Applicable Standards

American Society for Testing and Materials (ASTM)

- ASTM A53/A53M-12—Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
- ASTM A366/ASTM D609-00—Standard Practice for Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Conversion Coatings and Related Coating Products Cold-rolled steel
- ASTM A569—Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot Rolled Sheet and Strip Commercial Quality

- ASTM A621—Standard Specification for Steel, Sheet and Strip, Carbon, Hot Rolled, Drawing Quality
- ASTM A653/A653M-13—Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

International Building Code (IBC)

- IBC 2603.4/IRC R316.4—Foam Plastic Insulation, Thermal Protection

Testing

Structural Analysis and Testing letter from structural engineer available upon request.

Limitations

- Stadium Savers system is intended for permanent installations
- Stadium Savers metal forming systems are intended for interior applications
- Stadium Savers system is intended for applications and configurations that provide complete encapsulation of the Geofoam; details that expose the Geofoam, such as open stud walls without sheathing, do not comply with building code requirements and are not allowed
- Open flame cutting is not allowed near Stadium Savers Geofoam; protect Geofoam from ignition

5. Installation

Install system in compliance with architect’s plans and shop drawings as prepared by the manufacturer. Stadium Saver systems include positive mechanical connection of foam layers. No glue required.

Preparatory

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Field verify the elevation and dimensions.

D. Support:

1. Geofoam shall bear on a sound concrete slab or prepared subgrade.
2. Any subgrade suitable to support a concrete floor is acceptable to support the Stadium Savers System.
3. Existing or new sloped floors are acceptable as well as level bearing surfaces.

- Easily conforms to straight or curved fronts
- No earth or structural concerns for adjacent walls
- Specifically designed for staged construction and minimum revenue losses
- High strength to resist movement, settlement and crushing
- Sound insulation
- Factory fabricated; no or minimal field cutting
- Predictable material behavior
- Platform or riser mount seat applications
- Quick and efficient concrete placement
- Insect-resistant Geofoam available
- Galvanized metal parts available
- Seismic concerns can be accommodated
E. Surround walls:
1. Side and rear wall shall be in place prior to the start of installation.
2. Metal or wood stud walls shall be sheathed finished on the side where Geofoam will be stacked prior to starting work.

F. Completion of overhead work recommended prior to installation of the system.

Methods

Geofoam Installation

1. Install blocks in layers at locations indicated on shop drawings.

Note: Hold dimensions on shop drawings and architect’s plans. Stadium Savers blocks are fabricated small for convenient installation.

2. Place gripper plates between each layer of Geofoam in quantities as noted on shop drawings.

Note: Gripper plates are shipped with the foam and they provide stabilization between successive layers of Geofoam. Stadium Savers recommends that three gripper plates be used per 4 x 8 foot block; one gripper plate within six inches of the front-middle edge, the remaining two gripper plates at each end, within six inches of the front and side.

Riser System

The Stadium Savers Ltd. EPS Geofoam stadium seating riser system is based upon simple mechanical connections requiring no special tools or welding. No welds, screws, or temporary bracings are required. (See Metal Riser System Diagram.)

Floor Mount System: (see Installation Diagram 1)

1. Install Thermal Barrier of two layers 5/8 inch of Gypsum wall board.
2. Place metal riser and bracket assembly in front of the Geofoam and Thermal Barrier.
3. Press Tab “A” of the support bracket into the horizontal welded receiver tabs of the metal riser.

Floor Mount System installation diagram 1

Riser Mount System installation diagram 2
4. Press Tabs “B”, “C” and “D” into the top surface of the Geofoam blocks.
5. Install foam stakes along the bottom risers to anchor the risers to Geofoam. Refer to shop drawing for spacing.

**Riser Mount System:** (See Installation diagram 2.)
1. Thermal Barrier: Concrete serves as a thermal barrier; no gypsum needed.
2. Place metal riser and bracket assembly in front of the Geofoam.
3. Press Tab “A” of the support bracket into the horizontal welded receiver tabs of the metal riser.
4. Press Tabs “B”, “C” and “D” into the top surface of the Geofoam blocks.
5. Install foam stakes along the bottom risers to anchor the risers to Geofoam. Refer to shop drawing for spacing.

**Note:** For ease of installation, in addition to our standard riser mount system, Stadium Savers can provide pre-punched risers and bolt assemblies for field mounting of seats. Prior to the concrete pour, bolt assemblies are inserted into pre-drilled holes in the metal riser.

**Step Form Installation**
1. Install step forms in locations shown on shop drawings.
2. Screw step forms to metal riser face with self-tapping sheet metal screws.

**Pouring Concrete**
The concrete is poured or pumped, working from the top riser platform down. Care should be exercised so as not to dislodge or move the metal risers, as they are the finished riser face.

Concrete riser platform is typically a four inch concrete with reinforcing mesh; six inch concrete may be utilized (or necessary) in certain riser-mounted loading conditions. A structural engineer should be retained to evaluate the concrete and surround walls. Concrete finish should be acceptable for the specified floor finish. Concrete and finishing are provided by the concrete contractor.

**Precautions**
A. Do not weld or allow open flame near Geofoam.
B. Protect cold-formed metal parts from corrosion, deformation and other damage during delivery, storage and handling.
C. Store cold-formed metal parts, protect with a waterproof covering and ventilate to avoid condensation.
D. Protect plastic insulation as follows:
   1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
   2. Protect against ignition at all times.
   3. Do not deliver materials to project site before installation time.
   4. Complete installation and concealment of materials as rapidly as possible in each area of construction.

**6. Availability and Cost**

**Availability**
Stadium Savers products are readily available throughout the continental US and Canada.

**Cost**
Due to the custom nature of the Stadium Savers system, please contact manufacturer for project specific pricing.

**7. Warranty**
Stadium Savers warranties the materials to be free of defect for a one (1) year period.

**8. Maintenance Instructions**
The Stadium Savers systems are encapsulated in concrete, requiring no maintenance.

**9. Technical Services**
For technical questions, please contact Stadium Savers, Ltd. at 616-785-5598 or stadium@stadiumsavers.com.

**10. Filing System**
- ManuSpec®
- CMD
- Additional product information is available from the manufacturer upon request.