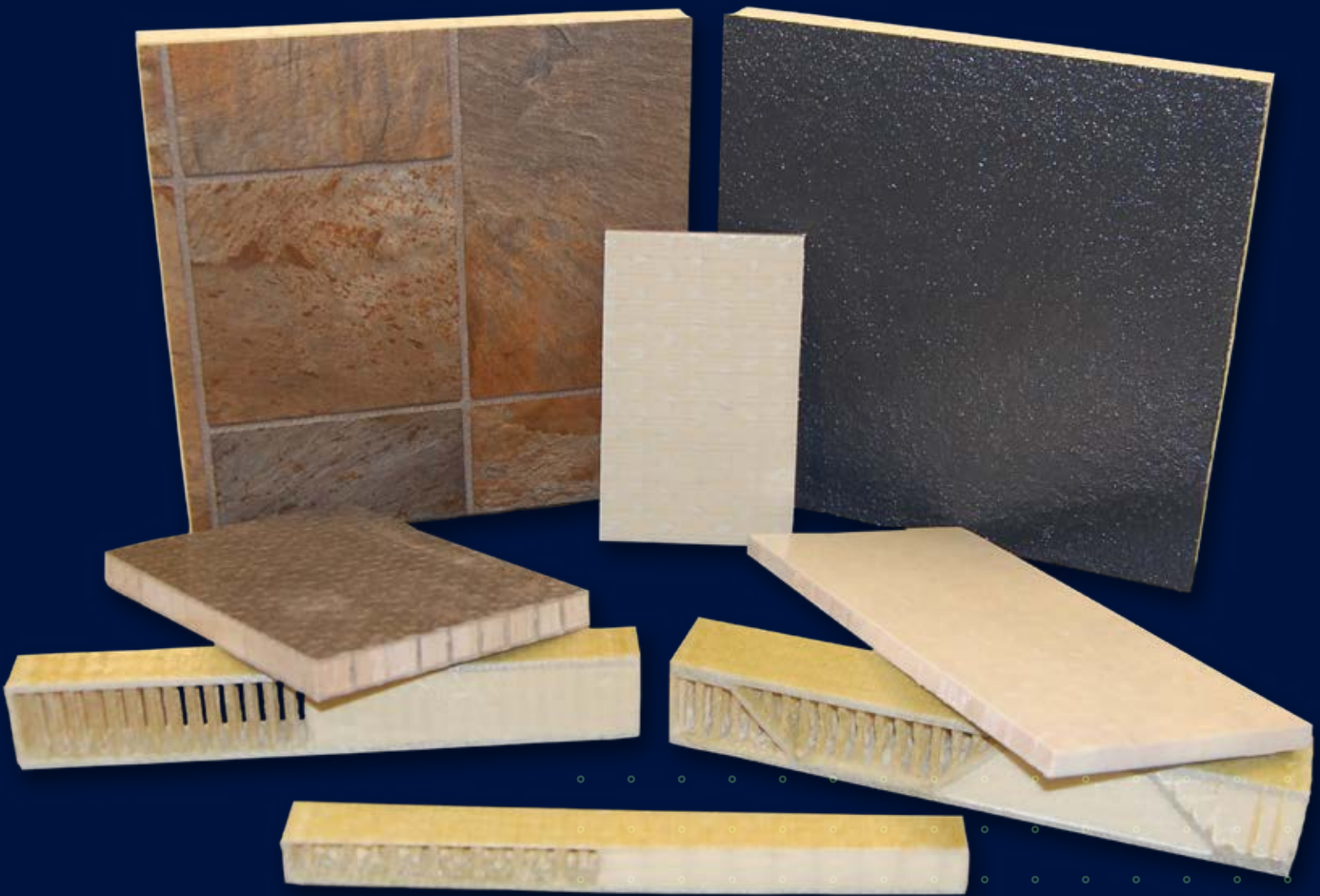


Transonite® Panel System

# Providing Greater Durability Than Conventional Sandwich Panels



LIGHTWEIGHT, HIGH STRENGTH, EXTREMELY DURABLE COMPOSITE PANEL SYSTEM

# What is Transonite?

Transonite is a pultruded 3-D Fiber Reinforced Polymer (FRP) “sandwich panel” consisting of thermoset resins, FRP skins, a core, custom designed 3-D insertions known as Fiber Insertions Per Square Inch (FIPSI) and in some cases shear webs for increased shear and compression capacity.

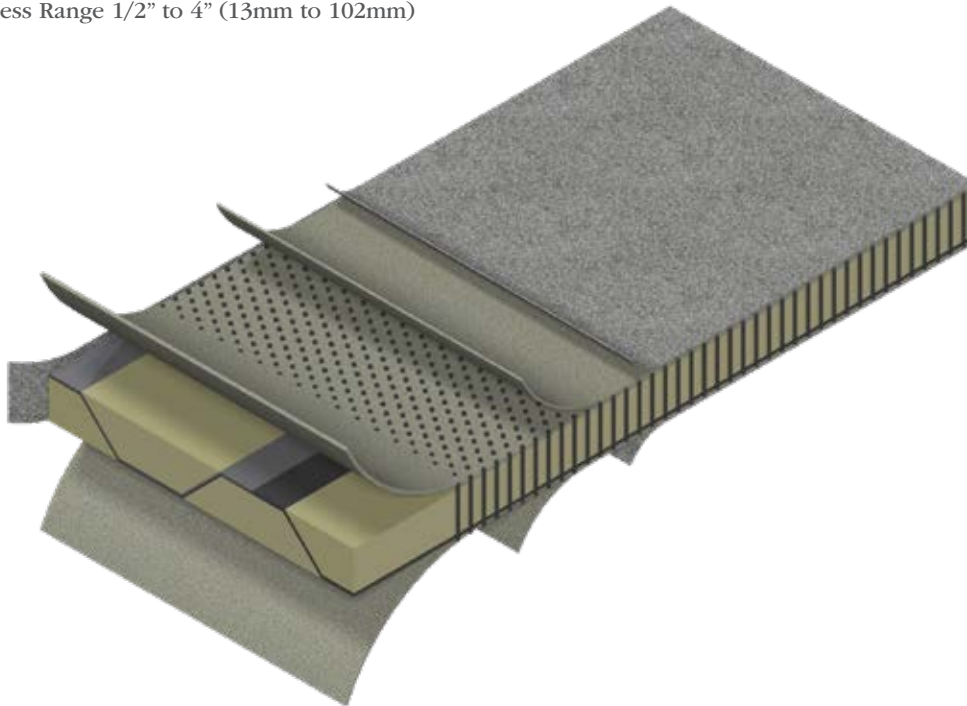
Transonite can be manufactured with thermoset resins including Vinyl Esters, or Polyesters, with or without fire retardant additives.

Special colors and resins are available where architectural, chemical, temperature, flame, smoke and toxicity may dictate that our standard systems will not meet your criteria. Creative Composites Group’s (CCG) highly skilled engineering team can put together an engineered solution to fit your application.

The top and bottom FRP face skins can be engineered for your specific application. The face skin thickness and fiber volume fractions can also be customized to meet your specific design requirements.

The core material can be made of closed cell polyisocyanurate or phenolic foam, or end grain balsa wood depending on the application.

- Up to 8’ - 6” wide (2.59m)
- Thickness Range 1/2” to 4” (13mm to 102mm)



- 3-D Fiber Insertions 0 to 19 Fiber Insertions Per Square Inch (FIPSI)
- FRP Face Skins 0.050” to 0.50” (1.27mm to 12.7mm)
- Polyisocyanurate Foam Core

Fiber insertions connect the top and bottom skins by means of mechanical FRP insertions. The fiber insertion density can range from zero to nineteen FIPSI. The FIPSI pattern density significantly enhances the local compression strength, full section bending strength as-well-as the shear modulus and strength. Unlike traditional FRP panel structures, the patented fiber insertions prevent undesirable delaminations traditionally associated with cored FRP panels.

Shear webs can be incorporated into the Transonite panel when high shear and localized strength is required. CCG can custom-design the shear webs in terms of the angle, thickness and pattern depending on your application.



Close Up of the Fiber Insertions with the Core Foam Removed

Transonite is a lightweight, high strength, extremely durable composite panel. With a wide variety of uses, this patented technology provides an alternative for structural and non-structural flat panel applications. Some examples include:

- Off-road Mats
- Heavy Truck Cabs, Floors and Sleepers
- Construction Panels
- Industrial Flooring
- Sound Walls/Barriers
- Pallets
- Roadway/Pedestrian Covers
- Air Cargo Containers
- Containment Basing
- Transformer Pads
- Refrigerator Shipping Containers
- RV Walls, Roofs and Floors
- Trailer Floors
- Boat Bulkheads and Flooring
- Tanks
- Wall Panels
- Doors
- Customized I-Beams
- Scaffolding Planks
- Insulated Tank Covers
- Privacy Fence
- Blast Panels
- Temporary Shelters

Transonite can be manufactured in various thicknesses, widths and lengths. The following chart depicts the current range of the Transonite product.

### Transonite Product Range

Parameter	Minimum	Maximum
Width, in (mm)	6 (152)	102 (2591)
Length, in (mm)	1 (25.4)	Limited only by Shipping
Skin Thickness, in (mm)	0.050 (1.27)	0.5 (12.7)
Sandwich Thickness, in (mm)	0.5 (12.7)	4 (102)
3D Fiber Density (FIPSI)	1/2 per sq inch	19 per square inch

### SECONDARY OPERATIONS

CCG can perform a variety of secondary operations to custom fabricate your Transonite panels after the pultrusion process. Our design and build capabilities include a full-service CNC manufacturing center that can customize and reshape standard panels. Our machining systems can route custom Transonite shapes, and perform milling and drilling operations.

In addition, we can add various surface finishes to your panel including: application of polyurea (Rhino-Lining) coating, linoleum floor covering, pressure-sensitive films or decals and aggregate grits. Customized surfaces can be used to provide durability, architectural appeal and safety enhancements like anti-skid.

# Transonite Features & Advantages

The 3-D through-thickness fibers in Transonite provide greater durability than conventional sandwich panels. Delamination, a common problem in traditional sandwich materials is virtually eliminated with the 3-D reinforcements that tie the face sheets together. Additionally, Transonite is one of the only panel products available which can be produced at any length, and width up to 8.5 feet. This provides large clean surfaces with no edges or seams. Transonite can be manufactured using a wide variety of core materials, reinforcements, fabrics, and resins.

Transonite Delivers:

- Extremely High Strength
- Very Lightweight
- Corrosion Resistance
- Extreme Durability
- Large Panel Size
- Acoustic Dampening
- Insulative Properties
- High Volume Production
- Fire Resistant Properties
- Reduced Labor

## Transonite Mechanical & Physical Properties

Mechanical and physical properties vary depending on the resin type, FIPSI pattern, skin thickness, fiber orientation, core material and shear web configuration when applicable. Typical FRP face sheet properties are presented below.

### Typical Skin Properties

Test	Imperial Units	Metric Units
Tensile Strength Lengthwise ASTM D638	24,000 psi	165 Mpa
Tensile Strength Crosswise ASTM D638	22,000 psi	152 Mpa
Tensile Modulus Lengthwise ASTM D638	2.8E6 psi	19.3 Gpa
Tensile Modulus Crosswise ASTM D638	2.3E6 psi	15.9 Gpa
Compressive Strength Lengthwise ASTM D695	8,600 psi	59.2 Mpa
Compressive Strength Crosswise ASTM D695	8,600 psi	59.2 Mpa
Compressive Modulus Lengthwise ASTM D695	2.8E6 psi	19.3 Gpa
Compressive Modulus Crosswise ASTM D695	2.8E6 psi	19.3 Gpa
In-Plane Shear Strength Lengthwise ASTM D2344	5,000 psi	34.4 Gpa

The perpendicular compression strength of the finished panel, depending on the number of FIPSI and shear webs, ranges from 100 to 1200 psi.

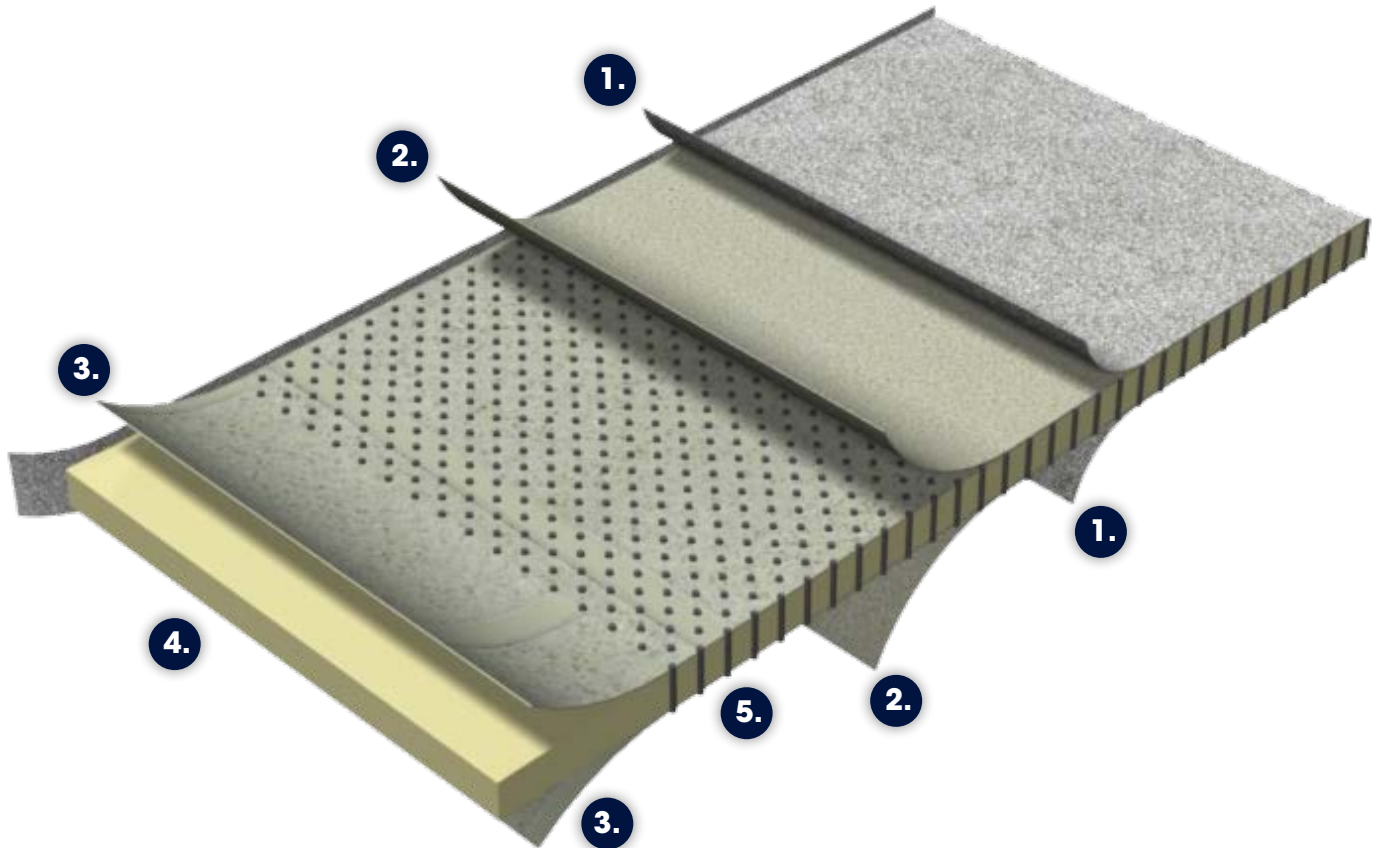
The shear strength ranges from 20 psi to 400 psi.

*Note: CCG can custom-design a Transonite panel to meet a customer's mechanical and physical properties.*



# Typical Transonite Panel Systems

## 1.0" Thick 4.0 FIPSI 0.070" FRP Face Sheets (PA510)



### Typical Fiber Architecture:

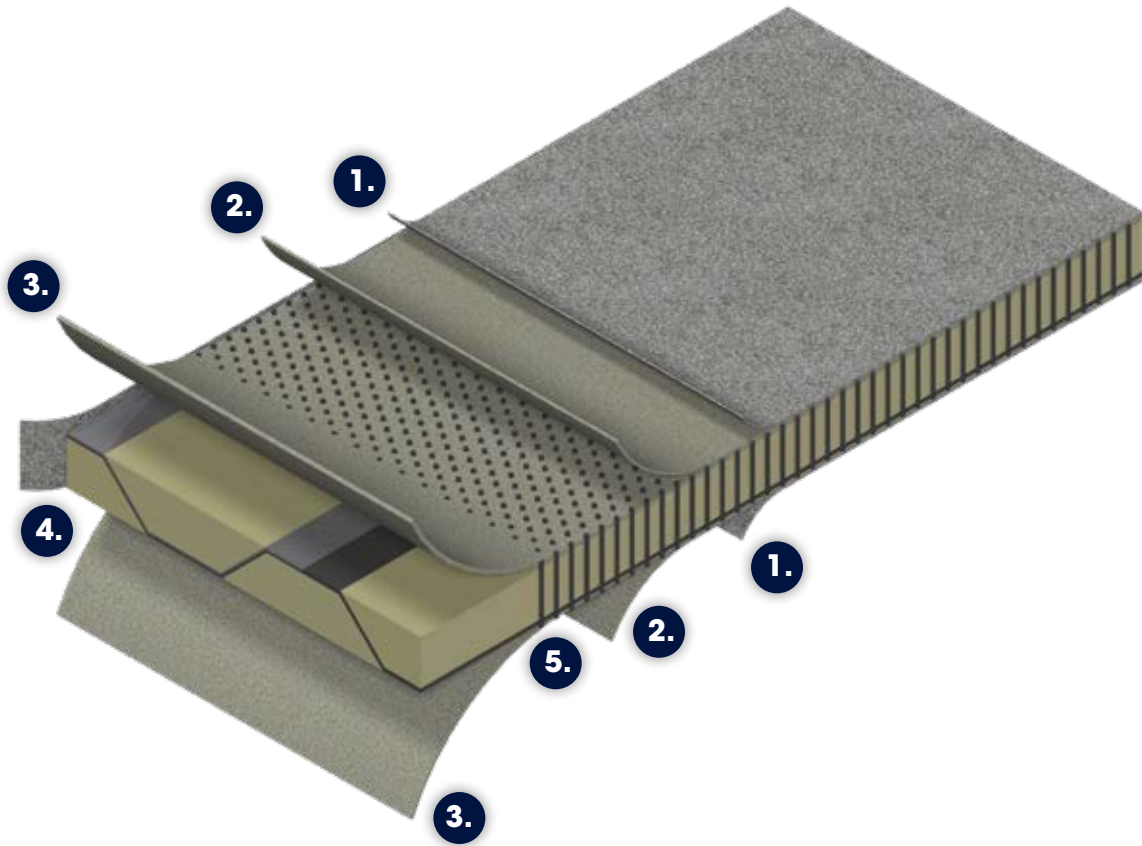
1. 10 Mil Nylon Veil
2. E/E-CR Glass—Continuous Filament Mat
3. E/E-CR Glass—Glass Woven Roving Fabric
4. 2 pcf Polyisocyanurate Foam Core
5. E/E-CR Fiber Inserts

E = E-glass (Electrical Grade Fiberglass)  
 E-CR = E-glass Corrosion Resistant (Boron Free)

Typical Physical Properties
Thickness: 1.0" (25.4mm)
Face Skin Thickness: 0.07" (1.8mm)
FIPSI: 4.0 Staggered Pattern
Weight: 2.0 psf (9.77 kg/m <sup>2</sup> )
Core Material: Polyisocyanurate Foam 2 pcf density

Typical Panel Mechanical Properties
Flexural Strength: 3,400 psi (23.4 Mpa)
Flexural Modulus: 4.1E5 psi (2.8Gpa)
Shear Strength: 73 psi (503 kpa)
Compression Strength: 260 psi (1.8Mpa)

## 2.0" Thick 5.33 FIPSI 0.24 and 0.17" FRP Face Sheets (PA521) 6/4



### Typical Fiber Architecture:

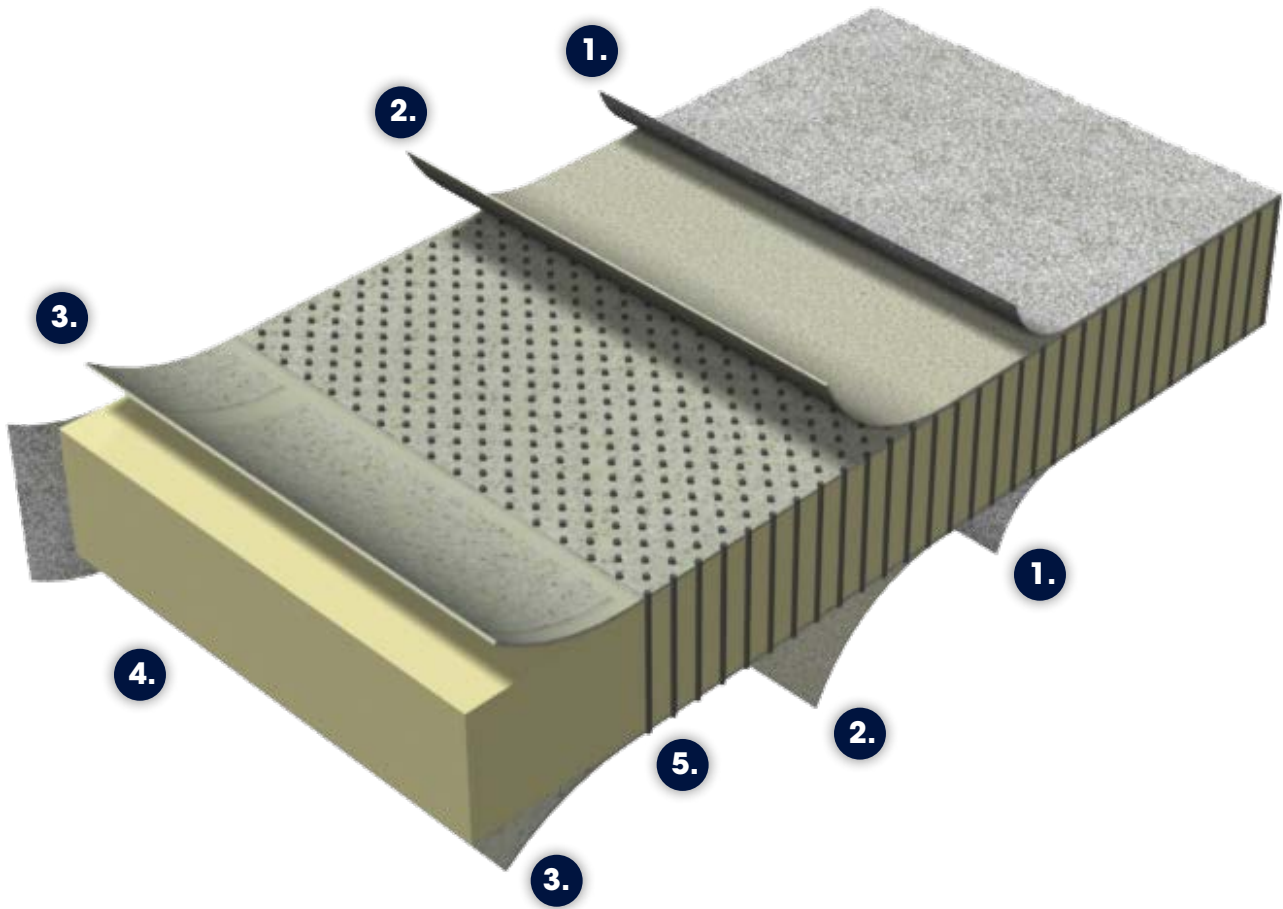
1. 10 Mil Nylon Veil
2. E/E-CR Glass—Continuous Filament Mat
3. E/E-CR Glass—Glass Woven Roving Fabric
4. 2 pcf Polyisocyanurate Foam Core
5. E/E-CR Fiber Inserts

E = E-glass (Electrical Grade Fiberglass)  
 E-CR = E-glass Corrosion Resistant (Boron Free)

Typical Physical Properties
Thickness: 2.0" (50.8mm)
Face Skin Thickness: 0.24" and 0.17" (6.1mm&4.3mm)
FIPSI: 5.3 Staggered Pattern
Weight: 6.6 psf (32.2 kg/m <sup>2</sup> )
Core Material: Polyisocyanurate Foam 2 pcf density

Typical Panel Mechanical Properties (AOC)
Flexural Strength: 18,530 psi (128 Mpa)
Flexural Modulus: 1.95E6 psi (13.4 Gpa)
Shear Strength: 274 psi (1.9 Mpa)
Perp. Compression Strength: 280 psi (1.9 Mpa)

## 3.5" Thick 4.0 FIPSI 0.17" FRP Face Sheets (PA535)



Typical Fiber Architecture:

1. 10 Mil Nylon Veil
2. E/E-CR Glass—Continuous Filament Mat
3. E/E-CR Glass—Glass Woven Roving Fabric
4. 2 pcf Polyisocyanurate Foam Core
5. E/E-CR Fiber Inserts

E = E-glass (Electrical Grade Fiberglass)  
 E-CR = E-glass Corrosion Resistant (Boron Free)

Typical Physical Properties
Thickness: 3.5" (88.9mm)
Face Skin Thickness: 0.17" (4.3mm)
FIPSI: 4.0 Staggered Pattern
Weight: 5.3 psf (25.9 kg/m <sup>2</sup> )
Core Material: Polyisocyanurate Foam 2 pcf density
Thermal Resistance: 11.67 hr*ft <sup>2</sup> *°F/BTU

Typical Panel Mechanical Properties (1525)
Flexural Strength: 3,300 psi (23.2 Mpa)
Flexural Modulus: 5.5E5 psi (3.8 Gpa)
Shear Strength: 22 psi (151 kpa)
Perp. Compression Strength: 180 psi (1.2 Mpa)
Pin Bearing: 9,800 psi (67.5 Mpa)
Screw Pull Out (#9 deck screw): 385 lbs (174 kg)

# Choose Creative Composites Group for Comprehensive Project Support

## Your Single Source for Innovative Engineered Panel and Decking Solutions Using Fiber Reinforced Polymer Composites

Advance your products and projects beyond the limitations of traditional panel materials by leveraging the combined strength of Creative Composites Group. We are a leader in technical innovation that is backed by the industry's most comprehensive FRP manufacturing group for infrastructure.

As Creative Composites Group, we can help you engineer and manufacture Transonite panels to meet your current requirements and the needs of future generations.

We offer comprehensive engineering, design and consultation for panel components. Our manufacturing capabilities include the broadest range of design and build solutions to meet your unique criteria. That's possible only with our proven engineering processes, end-to-end collaboration, service and support resources. Since FRP composites last longer than conventional materials they often have a lower lifetime cost when you consider longer service life and low to no maintenance costs.

## Discover Your Custom Engineered FRP Panel and Decking Provider

Creative Composites Group is committed to becoming a trusted business partner who is keenly interested in your project's success. Creative Composites Group works alongside your team, from owners to design engineers and contractors, to help you develop and customized FRP solution that meets the most demanding structural requirements and environmental conditions.

*Contact us for your next engineered FRP flooring, tank, container or decking project. We'd be thrilled to discuss it with you.*

**CreativeCompositesGroup.com**



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DLR010620221R1  
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