

## TuffSpan™ FRP Roof Deck

### Lasting Solutions for Challenging Conditions

### Cost Saving Solution for Roofing Systems

- Lower Life Cycle Cost • Better Work Conditions

Corroded roof decks create huge costs and problems for industrial plants with continuous wet conditions or chemical exposures. For these tough conditions, Tuff Span™ FRP roof deck offers a long term solution for building owners with: 1) Corrosion protection for roof systems; 2) Protection from falling deck particles for workers, equipment, and finished product; 3) Elimination of costly maintenance and roof replacement.

### High Strength to Weight

- Reliable Support for Loads • Lightweight

To optimize structural properties, glass fiber reinforcements make up 50% of the material weight. The high reinforcing content in bidirectional alignment produces high strength and stiffness for support of high, long term loads. As an alternative to concrete channel slab deck, Tuff Span can provide a 13 lb. psf reduction in dead load on the building structure.

### Corrosion Resistance

- Long Service Life • No Maintenance

As an alternative to metal or wood, Tuff Span™ materials do not rust, rot, peel, or flake. Its premium, vinyl ester resin system ensures long, maintenance-free, service life. A corroded steel deck often can lead to premature replacement of the deck and entire roof assembly. This cost can be avoided by installing Tuff Span roof deck.

### Product Options

- For Various Roof Systems • UL & FM Certifications

Offered in two profiles, Tuff Span roof deck is suitable for use with both membrane and multi-ply roofing and most building conditions. Materials are offered in different classifications including UL Class I Flame Spread and FM Approval for various certification and building code requirements. Standard colors are gray and white.



Corrosion resistant Tuff Span is a suitable substrate for either single-ply or built-up roofing.



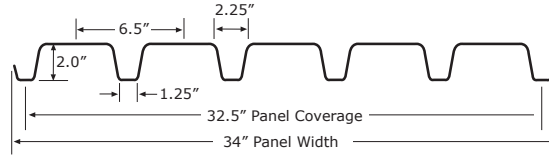
Mechanical fasteners, hot or cold adhesives can be used to attach roofing membrane and insulation.

Properties	6.5 x 2 VFR 500	8.0 x 3.5 VFR 700
Nominal Weight /SF	1.06 lb.	1.375 lb.
Nominal Glass Content	50% by Wt.	50% by Wt.
Resin System	Fire Retardant, Vinyl Ester (VFR)	Fire Retardant, Vinyl Ester (VFR)
Flame Spread Rating, ASTM E-84	25 or less (Class 1)	25 or less (Class 1)
Moment Capacity/ft.	11,850 lb. in.	12,400 lb. in.
Stiffness, EI/ft.	2.32 x 10 <sup>6</sup> lb. in. <sup>2</sup>	5.85 x 10 <sup>6</sup> lb. in. <sup>2</sup>
Fastener Pullover, per fastener	630 lb (.729" diam. washer)	850 lb. (1.125" diam. washer)
Flexural Strength, ASTM D790	55,000 psi	55,000 psi
Flexural Modulus, ASTM D790	2.4 x 10 <sup>6</sup> psi	2.4 x 10 <sup>6</sup> psi
Tensile Strength, ASTM D790	42,000 psi	42,000 psi
Coefficient of Thermal Expansion, ASTM D-696	8 x 10 <sup>-6</sup> in/in°F	8 x 10 <sup>-6</sup> in/in°F

## TuffSpan™ FRP Roof Deck

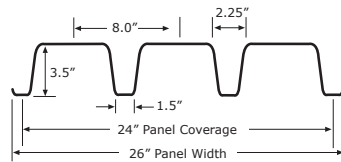
### Lasting Solutions for Challenging Conditions

### Tuff Span 6.5 x 2 VFR 500



Dead + Live / Uplift Loading							
Uniform Load, PSF	20	30	40	50	60	70	80
One Span	7'0"	6'1"	5'6"	5'1"	4'10"	4'7"	4'4"
Two Span	9'4"	8'2"	7'5"	6'11"	6'6"	6'2"	5'10"
Three Span	8'7"	7'6"	6'10"	6'4"	6'0"	5'8"	5'5"

### Tuff Span 8.0 x 3.5 VFR 700



Dead + Live / Uplift Loading							
Uniform Load, PSF	20	30	40	50	60	70	80
One Span	9'6"	8'3"	7'6"	7'0"	6'7"	6'3"	6'0"
Two Span	12'9"	10'6" / 11'1"	9'1" / 10'1"	8'1" / 9'4"	7'5" / 8'6"	6'10" / 7'9"	6'5" / 6'9"
Three Span	11'9"	10'3"	9'4"	8'8"	8'2"	7'8"	7'2" / 7'5"

Span limits are based on deck fastened to each support at each low rib; Deflection=L/180; Factor of Safety=2.5 Live Load, 1.88 Uplift (2nd span).

## FM Wind Uplift

Tuff Span Roof Deck	6.5 x 2 VFR 500	8.0 x 3.5 VFR 700	Notes
Maximum Span	6'3"	8'0"	1) Required at each low rib of deck unit. 2) Each 4' x 8' insulation board panel. 3) With 300 lb. concentrated load. 4) Automatic sprinklers required for Class II systems.
Fastener Washer Diam. (1)	1-60: .729"; 1-90: 1.125"	1.125" (5)	
Side Lap Fasteners	18" o.c.	24" o.c.	
Insulation Fasteners (2)	18 fasteners	18 fasteners	
Poly-Iso Insulation Board	1.3" thick min	1.3" thick min	
Wind Uplift Rating	1-90	1-90	
Deflection Limit (3)	L/240	L/240	

- A roofing assembly with Tuff Span 6.5 x 2 roof deck has FM Global approval for Class 1 fire and Class 1-90 windstorm classification. Contact Enduro for details or see FM Global Roof Nav listing.

- Other assemblies with Tuff Span roof decks are considered as Class II per FM Report J.I. OTOA9.

- Tuff Span roof decks are UL Listed for Class 90 Uplift: Construction #NM523 for 6.5; #NM524 for 8.0.

## Specifications

### Part 1 - General

FRP roof deck shall be Tuff Span manufactured by Enduro Composites, Houston, Texas.

### Part 2 - Products

2.01 Roof deck shall be:

\_\_\_\_\_ 6.5 x 2 VFR 500 \_\_\_\_\_ 8.0 x 3.5 VFR 700

2.02 Glass fiber reinforcements shall be 50% of the weight in bidirectional alignment.

2.03 Resin type shall be premium grade vinyl ester.

2.04 Material shall have Class I Flame Spread Rating of 25 or less per ASTM E84.

2.05 Color shall be: \_\_\_\_\_ White \_\_\_\_\_ Gray.

### 2.06 Design Criteria

A. Dead + Live Load: L/D = 180, FOS = 2.5B. Wind Uplift Load: L/D = 180, FOS = 1.88

### Part 3 - Execution

3.01 Roof deck shall be installed per Manufacturer's Installation Guide.

3.02 Roofing insulation/membrane shall be attached by: \_\_\_\_\_ Mechanical (positive lock) fasteners: Enduro NC Plastic, SFS-TPR Peel Rivet, or Rawl Speed-Lock Toggle.

\_\_\_\_\_ Cold adhesive: Olybond 500, Duro-Grip, or equal.

\_\_\_\_\_ Hot bituminous adhesive. Max temperature per NRCA Handbook of Accepted Roofing Knowledge.