



CREATIVE
COMPOSITES
GROUP®

TECHNICAL
SPECIFICATIONS
CATALOG

ENDURO® WATER & WASTEWATER PRODUCTS



FRP TANK COVER SYSTEMS • BAFFLE & PARTITION WALLS • ENCLOSURES

CreativeCompositesGroup.com

Welcome to Creative Composites Group

This catalog provides an overview of our tank cover, baffle and enclosure systems for water and wastewater treatment. In the following pages, you will find information which explains the applications, features and benefits of the various options we offer for each solution.

Enduro Composites – now part of Creative Composites Group (CCG) – has been a leader and innovator in this arena for over 35 years. Our resume and product offering, along with a proven history of successful installations, give you and your clients the peace of mind you are looking for in a solution-provider.

Our belief is that this industry will remain critical to society and the protection of our water supply, and we will continue to invest in innovative products and solutions for water and wastewater treatment in the years to come.

If you are interested in one of our solutions, email us at Sales@EnduroComposites.com or call us at 800-231-7271 to inquire with one of our design engineers. You can also contact us through our website at CreativeCompositesGroup.com.

Thank you for your interest in our FRP products. We look forward to working with you.



FRP Odor Control Cover



FRP Structural Baffle Wall



TuffSpan Walk-in Enclosure



PROVEN HISTORY

Enduro Composites (now part of CCG) has served the water and wastewater industry for over 35 years in the manufacture and development of FRP systems.

QUALITY & CONSISTENCY

With a world-class quality testing laboratory, we ensure consistent and reliable product performance through comprehensive programs of quality control.

TURN KEY SOLUTIONS

Because CCG is vertically integrated, from design and engineering to pultrusion and fabrication, we can deliver these solutions on-time and on-budget, at the quality level our customers expect.

ENGINEERING & DESIGN ASSISTANCE

Our experienced technical staff can provide engineering and design assistance for your project. If you have a unique design problem, chances are good we have encountered something similar before.

SPECIFICATION ASSISTANCE

The specification phase of a project is important to ensure the success of a tank cover or baffle wall system. With our broad history of installations in a wide variety of challenging environments, we can help you specify the right system attributes and structural properties to ensure long life and the best value for ownership.

INSTALLATION-READY SOLUTIONS

Our water and wastewater products are delivered with components pre-fabricated, complete with drawings and numbered parts to ensure easy assembly in the field.

CUSTOMER SERVICE & SALES SUPPORT

Our Customer Service desk is available to assist with questions, product selection or quotes.

Please call us today at 800-231-7271 or email Sales@EnduroComposites.com.

Perforated Baffle Wall



TABLE OF CONTENTS

4	FRP Tank Cover Systems Overview
6	AXS-3® Advanced Access Tank Cover System
10	AXS-3® NS No-Strut Cover
12	TreadMax® Non-Skid Surface Technology
13	XL6™ Tank Cover System
17	TuffSpan® Tank Cover System & Enclosures
21	FRP Structural Baffle & Partition Wall Overview
24	“D” Structural Baffle & Partition Wall
26	“H” Structural Baffle & Partition Wall
28	PulTex® Fiber Reinforced Sludge Flights
30	Clarifier Products
31	Industries & Products

APPLICATIONS

Cover Applications

- ▶ Odor Control
- ▶ VOC Emission Control
- ▶ Splash Control
- ▶ UV Screen / Algae Barrier
- ▶ Freeze / Thermal Barrier
- ▶ Water & Process Protection

Baffle Applications

- ▶ Flow Control
- ▶ Chemical Distribution
- ▶ Anoxic Zones
- ▶ Swing Zones
- ▶ Mixing
- ▶ Flocculation

Engineered for Water and Wastewater

Enduro FRP tank cover systems are engineered for the specific needs and requirements that are common for wastewater and water treatment operations.

Designed to give long-term service, each tank cover system is built upon 35 years of global leadership in research, development and production of FRP composites.

All our tank covers are constructed with high-strength, pultruded FRP components, entirely corrosion resistant, and designed for quick installation by local contractors.

Applications

To address a broad range of process, size and functional requirements, we offer four tank cover systems, each with specific benefits and advantages. Applications include:

- ▶ Odor Control
- ▶ VOC Emission Control
- ▶ Splash Control
- ▶ UV Screen / Algae Barrier
- ▶ Freeze / Thermal Barrier
- ▶ UV Screen / Algae Barrier
- ▶ Water Protection
- ▶ Process Protection
- ▶ Improved Aesthetics

AXS-3 Advanced Access Tank Cover System



TANK COVER SYSTEM TYPES



AXS-3 Advanced Access Tank Cover System

- Upgraded Operator Safety
- Advanced Accessibility
- Faster Installations
- Up to 40% Fewer Fasteners

The next generation AXS-3 tank cover system has upgraded features for safety and repeatable long-term removability utilizing strut channel nut connections. For more information, visit page 6.

XL6 Tank Cover System

- Odor Control
- Easy to Remove & Install
- Long Span Capability
- Safe for Foot Traffic



Designed for large basins, Enduro XL6 tank cover is an excellent low-profile cover system for odor control, accessibility, and service life. For more information and details on the XL6, please turn to page 11.

TuffSpan Tank Cover System

- Flat or Walk-in Access
- Lightweight & Easy to Install
- Translucent Panel Option
- Walkable Cover Option

For walk-in access or as a UV and debris barrier, Enduro TuffSpan tank covers offer a cost effective, corrosion resistant, structural enclosure. For more information and details on the TuffSpan cover, please visit page 15.



Advantages of Well-designed FRP

CORROSION RESISTANT

Manufactured with premium, iso-polyester and vinyl ester resin systems, Enduro tank covers offer superior protection against corrosive elements present in water and wastewater treatment operations as compared to aluminum.

HIGH STRENGTH

To ensure high strength and consistent quality, our FRP structural components are manufactured by automated pultrusion process, which utilizes high glass-fiber content and results in unparalleled product consistency.

LIGHTWEIGHT

The favorable strength-to-weight properties of FRP contributes directly to reduced loads on tank walls and floors and to the ease of cover removability and installation.

UV PROTECTION

Exterior coatings and stabilizers within the material provide UV protection for the Enduro FRP components and ensure long service life.

COST SAVINGS

The combination of corrosion resistance, high strength, and UV protection offered by well-designed FRP delivers longer service life, less maintenance, and life cost savings as compared to other materials.

System Design

BACK TO
TOP

TURN KEY SOLUTIONS

Enduro tank cover component panels are fabricated with penetration openings and angle cuts as well as integral hatch framing and flashing to eliminate field fabrication and make installation quick and easy. Solutions include all necessary accessories, including hatches, gooseneck vents, nozzles, flashings and hardware.

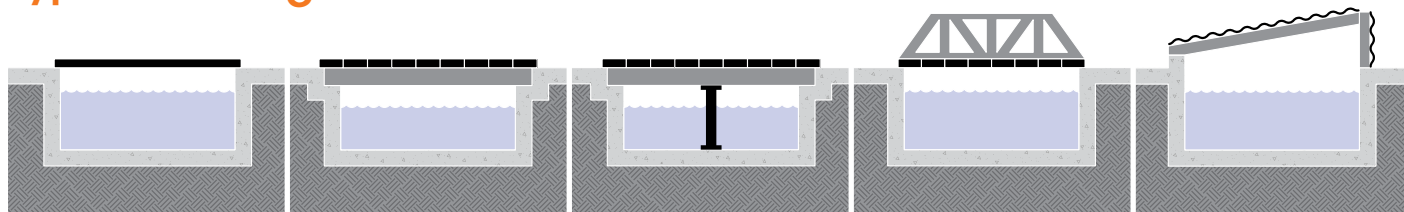
CUSTOMIZED SYSTEM

With multiple cover systems and configurations, our experienced technical staff customizes the design to meet project-specific load requirements including personnel, uplift, dead and snow loads.

LOW-PROFILE

With less air volume to process, our low-profile covers reduce operating cost and size of scrubber units compared to domes. Flat covers also improve aesthetic impact on communities, eliminate confined-entry issues, and provide protection for equipment located on top of the cover instead of below.

Typical Configurations



Flat, Clear Span

Channels and smaller tanks can be clear spanned using our XL6 panels (up to 20 feet).

Flat, Beam-supported

Medium-sized tanks or tanks which allow column supports can be spanned utilizing a combination of beams and Enduro decking panels.

Flat, Beam & Column Supported

Medium or large-sized tanks which allow column supports.

Flat, Truss-supported

For spans above 50 feet, Enduro offers truss-supported systems which utilize either our XL6 panels or TuffSpan panels.

Walk-in Enclosures

Raised configurations or FRP buildings can be designed for applications which require walk-in access or additional vertical space above the water surface.

AXS-3 Advanced Access Tank Cover System



U.S. PAT. US 12,320,379 B2

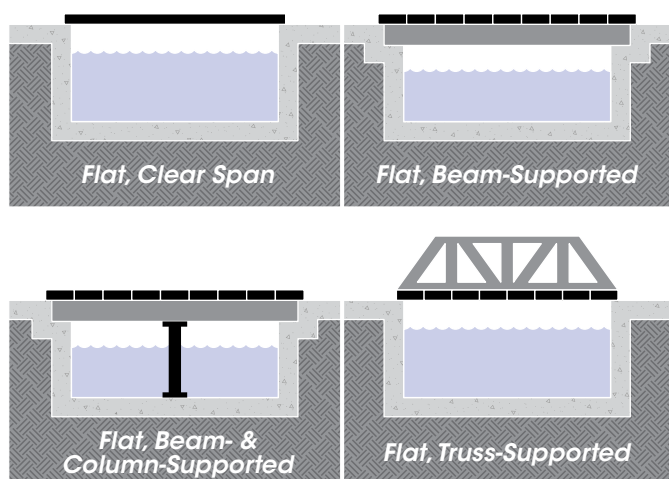
System Overview

Introducing our fifth generation of flat covers, the AXS-3 is Enduro's most advanced tank cover technology.

Utilizing strut and channel nut connections the AXS-3 provides exceptional accessibility.

The AXS-3 cover system also includes features improving operator safety while still being light weight.

Configurations available for the AXS-3 Tank Cover



Key AXS-3 Features & Advantages

INNOVATIVE STRUT CHANNEL NUT FASTENING SYSTEM

The strut and channel nut connections greatly improves accessibility for advanced repeatable panel removability. It eliminates the use of conventional screws and potential for wallowed out screw holes.

UPGRADED OPERATOR SAFETY

The AXS-3 cover system has numerous upgraded features to improve safety with walking surface transitions of 1/4" or less minimizing trip hazards. These include tapered end-joint flashing, countersunk fastener heads, high strength, pultruded panels with the option for utilizing the new TreadMax™ non-skid surface technology.

LOWER COST INSTALLATION

The AXS-3 panels are lightweight, easy to handle and install, with limited field fabrication. This innovative system uses up to 40% fewer fasteners, and features panels that are 2 inches wider than its XL3 predecessor, making it our lowest installed-cost cover.

TREADMAX INTEGRAL NON-SKID SURFACE TECHNOLOGY

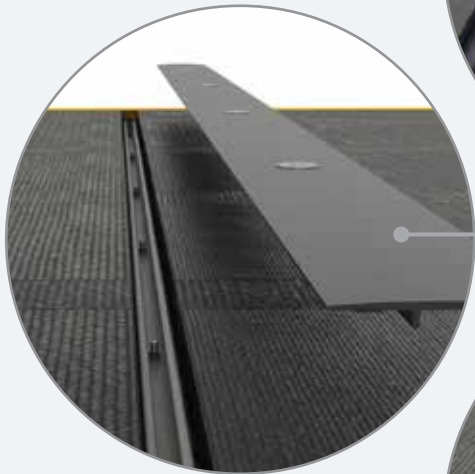
The FRP cover industry's first multi-directional non-skid surface technology. TreadMax is integrally manufactured into cover deck surface providing a superior option to non-skid tape or applied coatings. TreadMax exceeds the Dynamic Coefficient of Friction (DCOF) requirements set by ANSI A137.1/A326.3.

- ▶ Corrosion Resistant
- ▶ High Strength
- ▶ Lightweight
- ▶ UV Protection
- ▶ Turn Key Solutions
- ▶ Customized System
- ▶ Non-skid Surface
- ▶ Low Profile

BACK TO
TOP



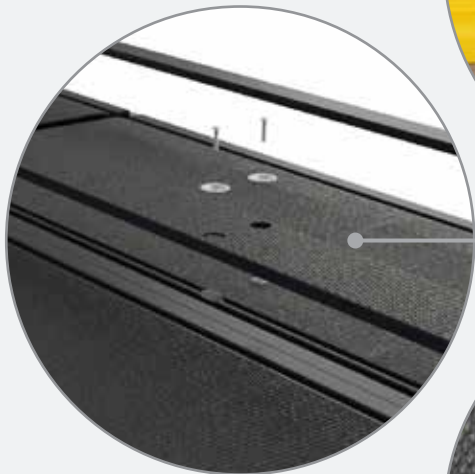
INNOVATIVE
STRUT CHANNEL
NUT FASTENING
SYSTEM



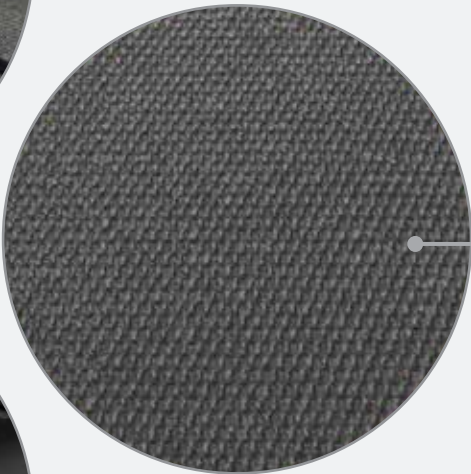
ODOR
CONTROL



UPGRADED
OPERATOR
SAFETY



EASY, LOW-COST
INSTALLATION



TREADMAX
NON-SKID
SURFACE
TECHNOLOGY

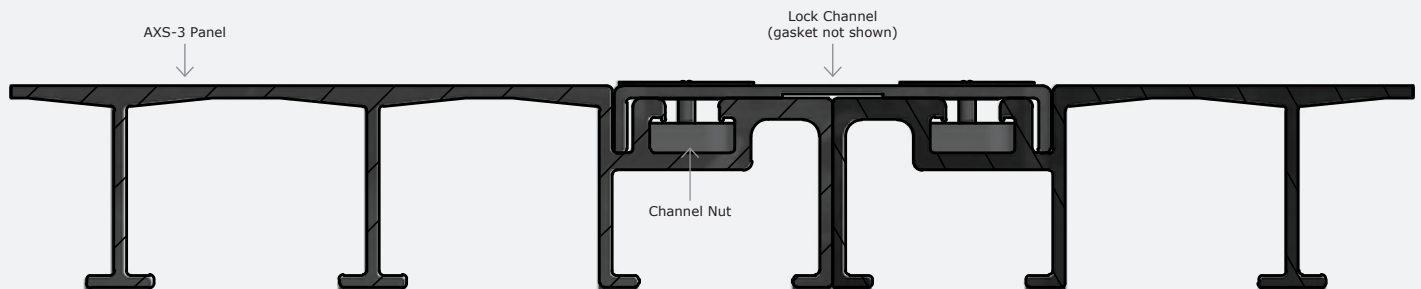


OUTSTANDING
STRENGTH &
CORROSION
RESISTANCE

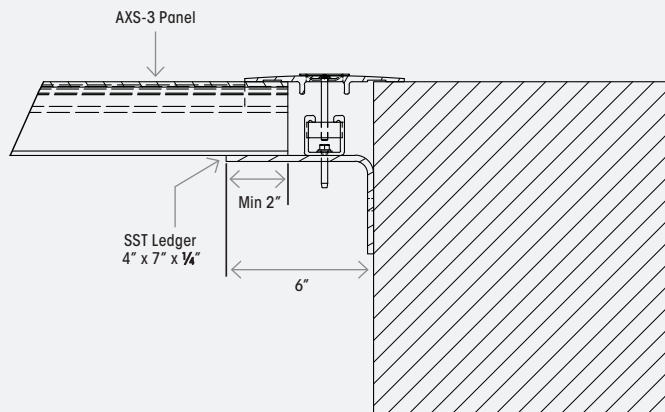
Typical Details

U.S. PAT. US 12,320,379 B2

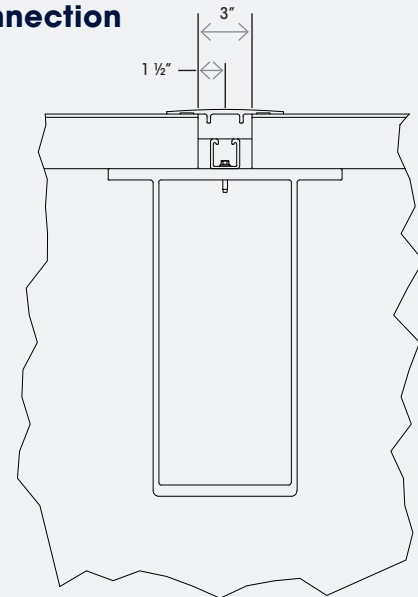
Panel Side-to-Side Locking Channel



Flush Concrete Wall Load Bearing End



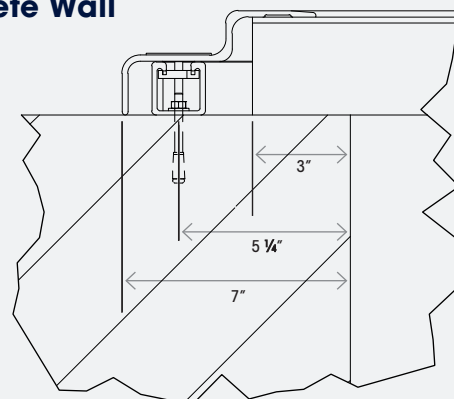
End-to-End Beam Connection



We also offer the **AXS-3 NS** (AXS-3 No Strut), which features our proprietary TreadMax® non-skid surface and a panel that is 2" wider than our previous generation XL3 panels.

Please see page 10 for additional details.

Top Mounted Concrete Wall



Maximum Allowable Spans, Lineal Feet

Uniform Positive Load, PSF		20		30		40		50		60	
Span Type		single	double	single	double	single	double	single	double	single	double
L/D	120	15.5	19.2	13.5	15.7	12.3	13.6	11.4	12.2	10.7	11.1
	180	13.5	18.1	11.8	15.7	10.7	13.6	9.9	12.2	9.4	11.1
	240	12.3	16.4	10.7	14.4	9.7	13.1	9.0	12.1	8.5	11.1
Concentrated Load, Lbs		250	300	400	500						
L/D	180	14.6	13.8	12.5	11.6						
	240	14.6	13.8	12.5	11.2						

maximum deflection = 5/8" due to concentrated load

Allowable spans are the lesser span controlled by: 1) deflection limit, L/D, or 2) Factor of Safety of 2.0 minimum for maximum allowable load. Allowable spans for concentrated loads also consider maximum deflection of 5/8". ABC 2015, Section 1607 requires minimum concentrated load loading of 250 lbs. distributed over 2.5'x2.5' area to determine spans for "All roof surfaces subject to maintenance workers." Please contact Enduro Composites for allowable spans for other requirements such as lower maximum deflection or negative loads for high wind conditions.

Specification AXS-3 ADVANCED ACCESS TANK COVER SYSTEM

PART ONE: GENERAL

1.01 Description of Work

Scope of this specification shall include materials for fiberglass reinforced plastic (FRP) tank covers, which may include, but not limited to deck panels; structural supports; flashing; fasteners and anchors; gaskets and sealant.

1.02 Design Criteria

- Design Loads shall comply with local codes with combined loads determined by Allowable Stress Method.
 - Dead + Live or Snow Load: _____ psf
 - Wind Uplift Load: _____ psf
 - Concentrated Load: _____ lbs
- Design Limits
 - Dead + Live or Snow Load: Deflection Limit=L/180; FOS=2.0
 - Wind Uplift less Dead Load: Deflection Limit=L/60; FOS=1.88
 - Concentrated Load: 300 lb. load distributed over 2.5'x2.5' area a mid-span of cover panel with deflection not to exceed 5/8" or L/180.
 - Each cover panel shall be removable vertically without having to remove adjacent panels or cutting of components. Individual panel units shall weigh no more than 135 pounds. Panels shall be fastened to structural supports and locking channel utilizing bolts with a locked-in-place channel nut.
 - Slip resistance of decking panels shall have (min average) Dynamic Coefficient of Friction of 0.50 per ANSI A137.1/A326.3 Dynamic Coefficient of Friction Test.
 - Top of tank cover system shall be flat with change in vertical level of walking surfaces no greater than 1/4".

1.03 Manufacture

- Tank cover supplier shall manufacture and fabricate all FRP components in its own facility, which shall have current ISO 9001 certification and shall be located in the USA.
- Tank cover manufacturer shall be solely responsible for the design and satisfactory performance of the cover system specified herein. No division of responsibility between manufacturer of FRP components and design is implied or allowed.

PART TWO: PRODUCTS

2.01 Manufacturer(s)

Standard for design and performance shall be AXS-3 Tank Cover System manufactured by Enduro Composites, 16602 Central Green Blvd., Houston, TX 77032, 713-358-4000.

2.02 Materials

FRP structural components including decking and structural supports shall be manufactured by pultrusion process. Color of components shall be charcoal gray.

- Glass fiber reinforcements shall be minimum of 50% of the material weight.
- Materials shall be fire retardant with flame spread rating of 25 or less per ASTM E84 test.
- Materials shall exhibit these Physical Properties (min):

Tensile Strength	30,000 psi	ASTM D 638
Compressive Strength	30,000 psi	ASTM D 695
Flexural Strength	30,000 psi	ASTM D 790
Stiffness	45,000,000 lb-in. ²	
- AXS-3 Tank Cover Deck Panels
 - FRP deck panels shall have minimum thickness of 3/16".
 - Resin type for FRP tank cover decking shall be: Isophthalic Polyester ____ Vinyl Ester.
 - Cover panels, end-to-end joint flashing and side-joint locking channel shall have TreadMax, non-skid surface with integral, multi-directional, slip-resistant walking surface.
 - Color of deck panels shall be standard gray.
- Structural Framing shall be FRP with polyester or vinyl ester resin. Metal connections to FRP beams shall be 304SS or 316SS.
- Hatches (if required) shall be sized per drawings and include a hold-open device and plastic or stainless-steel lift handles. Port hatches shall be 12 inches square or less.
- Flashing and Trim shall be FRP or 316SS.
- Hardware
 - Fasteners, anchors, hinges, and other accessories located on underside of cover shall be 316SS.
 - Perimeter flashing fasteners, concrete anchors, or other hardware not exposed to inside of tank shall be 304SS.
 - Fasteners to attach tank cover decking shall be 316SS and extend no more than 1/4" above panels. Fasteners shall be removable and reusable.
- Gaskets shall be installed and sealants applied by contractor per Manufacturer's guidelines.

**To learn more about
AXS-3 Advanced Access
Tank Cover System,
visit bit.ly/AXS-3Cover**



AXS-3 NS NO-STRUT COVER

BACK TO
TOP



System Overview

Delivering exceptional benefits and value, the AXS-3 NS Cover from Enduro Composites is one of the most versatile cover systems available.

Like its XL3 predecessor, the AXS-3 NS Cover offers appealing qualities for users and operators plus has lighter and easier to remove panels.

Key AXS-3 NS Features & Advantages

ODOR & VAPOR CONTROL

Sealed with EPDM gaskets at panel joints, end conditions, and at access hatches, the AXS-3 NS Cover effectively contains odors and gases associated with treatment processes. Tested air leakage is .17 CFM/SF at -.20 INWG.

SIZE VERSATILITY

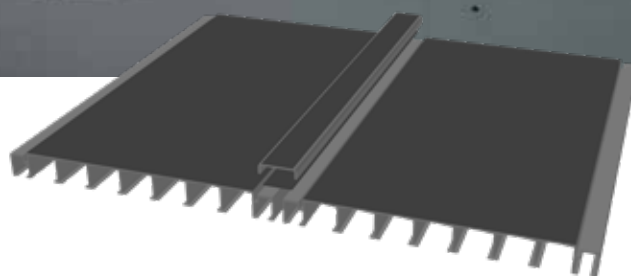
AXS-3 NS Covers are custom designed to accommodate most any size tank, either round or rectangular, large or small. Enduro's experienced technical staff can assist design engineers with cost budgets, appropriate material selection, system design, and specifications. For water and wastewater treatment operations, Enduro offers FRP: Tank Covers, Baffle Walls, Weirs and Scum Baffles, Density Current Baffles, Launder Covers, and Building Structures.

EASY ACCESS & REMOVABILITY

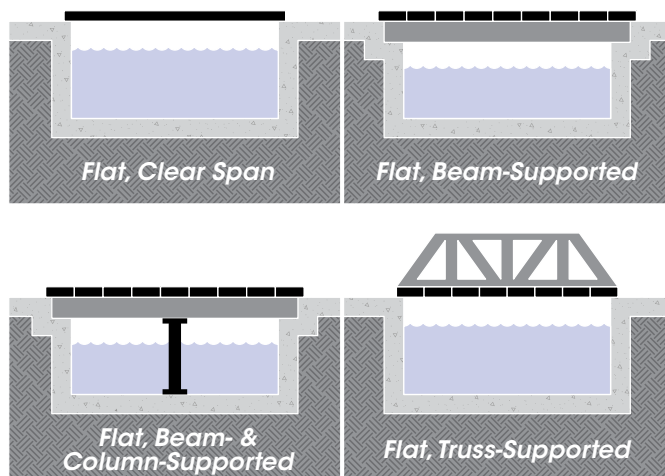
Weighing 11 lbs per lineal foot, Enduro AXS-3 NS panels are lightweight and easy to handle. Removing sections only requires backing out bolts from permanent nutserts. After removing bolts and locking channel, single panels can be removed easily. Access hatches can be sized to fit within individual 30" wide, AXS-3 NS panel sections.

TREADMAX INTEGRAL NON-SKID SURFACE TECHNOLOGY

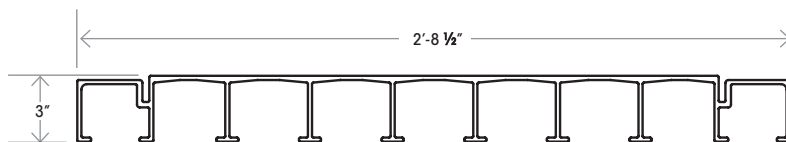
The FRP cover industry's first multi-directional non-skid surface technology. TreadMax is integrally manufactured into cover deck surface providing a superior option to non-skid tape or applied coatings. TreadMax exceeds the DCOF requirements set by ANSI A137.1/A326.3.



Configurations available
for the AXS-3 NS Cover



- ▶ Corrosion Resistant
- ▶ High Strength
- ▶ Lightweight
- ▶ UV Protection
- ▶ Turn Key Solutions
- ▶ Customized System
- ▶ Non-skid Surface
- ▶ Low Profile



Maximum Allowable Spans, Lineal Feet

Uniform Positive Load, PSF		20		30		40		50		60	
Span Type		single	double	single	double	single	double	single	double	single	double
L/D	120	13.9	18.6	12.1	16.3	11.0	14.8	10.2	13.7	9.6	12.9
	180	12.1	16.3	10.6	14.2	9.6	12.9	8.9	12.0	8.4	11.3
	240	11.0	14.8	9.6	12.9	8.7	11.7	8.1	10.9	7.6	10.2
Concentrated Load, Lbs		20		30		40		50			
Span Type		single	double	single	double	single	double	single	double		
L/D	180	12.1	14.7	10.6	13.8	9.6	12.5	8.9	11.6		
	240	11.0	14.7	9.6	12.9	8.7	11.7	8.1	10.9		

Allowable spans are the lesser span controlled by: 1) deflection limit, L/D, or 2) Factor of Safety of 2.0 minimum for maximum allowable load. Allowable spans for concentrated loads also consider maximum deflection of 5/8". IBC 2015, Section 1607 requires minimum concentrated load loading of 250 lbs. distributed over 2.5'x2.5' area to determine spans for "All roof surfaces subject to maintenance workers". Please contact Enduro Composites for allowable spans for other requirements such as lower maximum deflection or negative loads for high wind conditions.

Specification AXS-3 NS TANK COVER

PART ONE: GENERAL

1.01 Description of Work

Scope of this specification shall include materials for fiberglass reinforced plastic (FRP) tank covers, which may include, but not limited to deck panels; structural supports; flashing; fasteners and anchors; gaskets and sealant.

1.02 Quality Assurance

- Tank Cover supplier shall manufacture and fabricate all FRP components in its own facility, which must be based in USA and ISO 9001 certified.
- The manufacturer shall be solely responsible for the design, manufacturing, & fabrication of the cover system specified herein. No division of responsibility between manufacturer of components and design is implied or allowed.

1.03 Design Criteria

- Design Loads shall comply with local codes with combined loads determined by Allowable Stress Method.
 - Dead + Live or Snow Load: _____ psf
 - Wind Uplift Load: _____ psf
 - Concentrated Load: _____ lbs
- Design Limits
 - Dead + Live or Snow Load: Deflection Limit=L/180;
Factor of Safety=2.0
 - Wind Uplift less Dead Load: Deflection Limit=L/60;
Factor of Safety=1.88
 - Concentrated Load: 250 lb. load distributed over 2.5'x 2.5' area at mid-span of cover panel with deflection not to exceed 5/8" or L/180.
 - Each cover panel shall be removable vertically without having to remove adjacent panels or cutting of components.
 - Air leakage rate shall not exceed .17 CFM/SF at negative pressure of 0.2 inches of water column for a 5 minute duration per testing conducted by a certified agency.

- Glass fiber reinforcements shall be minimum of 50% of the material weight.
- Materials shall be fire retardant with flame spread rating of 25 or less per ASTM E84 test.
- Materials shall exhibit these Physical Properties (min):

Tensile Strength (ASTM D638)	30,000 psi
Compressive Strength (ASTM D695)	30,000 psi
Flexural Strength (ASTM D790)	30,000 psi
- AXS-3 NS Tank Cover Deck Panels
 - FRP deck panels shall have minimum thickness of 3/16".
 - Resin type for FRP tank cover decking shall be:
_____Isophthalic Polyester _____Vinyl Ester.
 - Top of the tank cover decking shall be flat with factory applied, non-skid, UV resistant surface, gray or beige color.
- FRP Structural Framing (if required)
 - Resin type for FRP beams shall be vinyl ester.
 - Metal angles or plates attached to FRP beams or connections shall be 316SS.
- Hatches (if required)
 - Access hatches shall be sized as indicated on drawings.
 - Hatches shall have a hold-open device to prevent door from blowing open or closing on itself.
 - Hatch lids shall have plastic or stainless steel lift handles.
 - View port hatches shall be 12 inches square or less.
- Flashing and Trim shall be FRP or 316SS.
- Hardware
 - Fasteners, anchors, hinges, and other accessories located on under-side of cover shall be 316SS.
 - Perimeter flashing fasteners, concrete anchors, or other hardware not exposed to inside of tank shall be 304SS.
 - Fasteners to attach tank cover decking shall be 316SS and have gasket seal washers.
- Gaskets and Sealants
 - Gaskets shall be installed at end joints of deck panels and below flashing to seal perimeter and seams.
 - Sealant shall be applied by Contractor at various locations as required.

PART TWO: PRODUCTS

2.01 Manufacturer(s)

Standard for design and performance shall be AXS-3 NS Cover System manufactured by Enduro Composites, 16602 Central Green Blvd., Houston, TX 77032, 713-358-4000.

2.02 Materials

FRP structural components including decking and structural supports shall be manufactured by pultrusion process. Color of components shall be charcoal gray.

**Please visit bit.ly/AXS-3NS
for expanded specification.**



TreadMax

Non-skid Surface Technology

U.S. PAT. US 12,320,379 B2

Our patent is based on innovations and solutions that prioritize our customers' needs.

To address needs within the water and wastewater industry for slip resistant walking surfaces with operator safety in mind we have developed this groundbreaking technology.

Introducing TreadMax, the industry's first integrally manufactured, multi-directional, non-skid FRP surface technology.

Advantages

- Innovative slip-resistant texture embedded into part during pultrusion manufacturing process
- Enhancement to applied non-skid tape
- No additional field labor required
- Maintenance-free with long service life

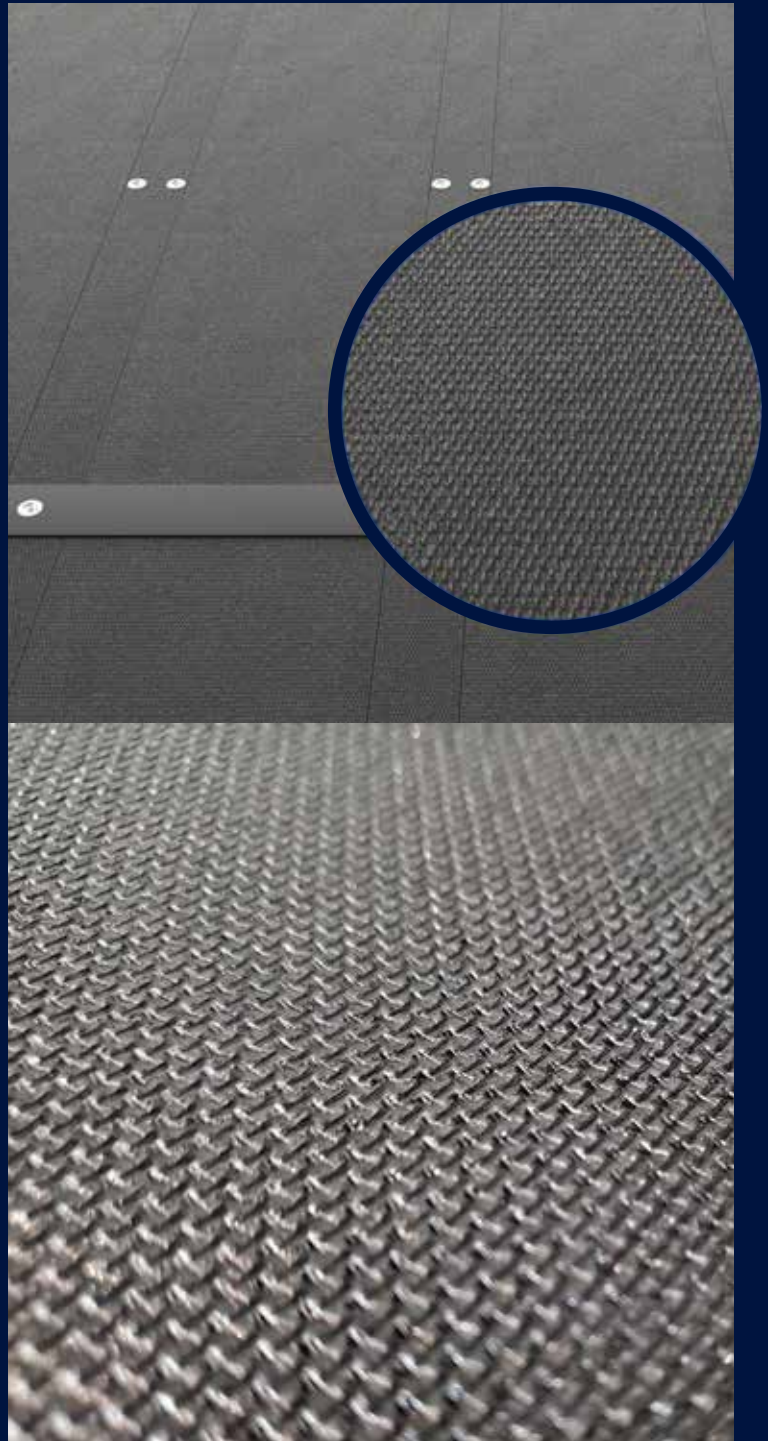
Tested Performance

Exceeds performance requirements per ANSI A137.1/A326.3 Dynamic Coefficient of Friction Test and ASHB198:2014 (AS/NZS 4586) Pendulum Test.

Markets

Enduro Composites is the perfect partner to develop a custom fiberglass product solution for your non skid application in the following markets:

- Water & Wastewater Treatment
- Industrial
- Commercial
- Infrastructure
- Building/Structural
- Mining
- Transportation
- Marine
- Government/Military
- Cooling Tower



**THE STANDARD
FOR SLIP RESISTANCE
ON FRP PRODUCTS**

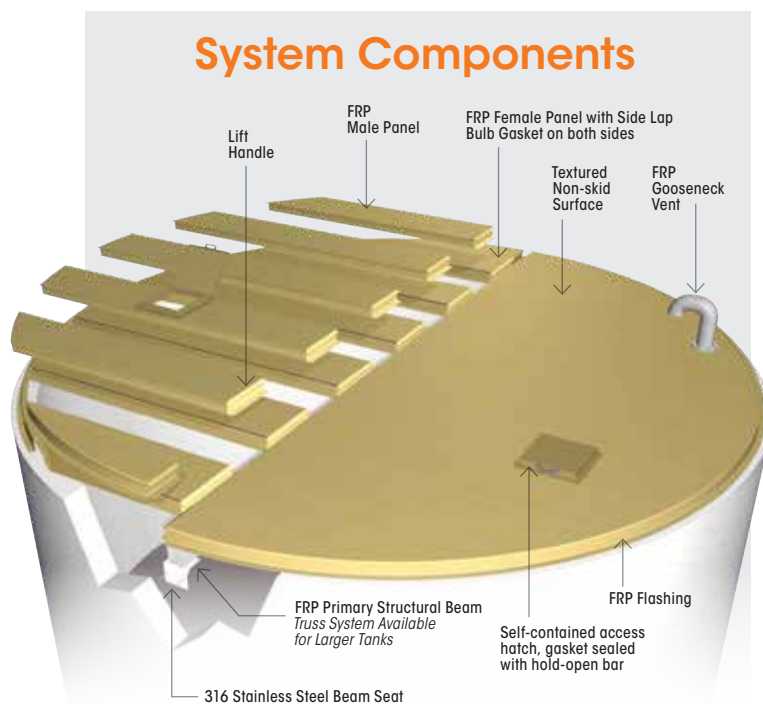
XL6™ Tank Cover System

System Overview

Designed with the needs of plant operators and installing contractors in mind, the features and benefits of the XL6 tank cover system are numerous and include effective odor control, easy-to-remove sections, long-span deck panels offering foot traffic safety, plus low profile advantage.

The XL6 flexible design is suitable for large rectangular or round basins and can be top-mounted on or flush with tank walls.

System Components



Key XL6 Features & Advantages

ODOR CONTROL

XL6 cover systems are effectively sealed with gaskets located at all outer edges, panel side laps and access hatches.

COMPLETE REMOVABILITY & ACCESSIBILITY

Able to be handled by two workers without lifting equipment, each XL6 male panel can be removed individually after removing only four nuts, and each XL6 female panel can be freely lifted after removing its two adjacent male panels. In addition, XL6 access hatches are self-contained within one panel, allowing panel removal without affecting adjacent panels.

LONG SPAN CAPABILITY

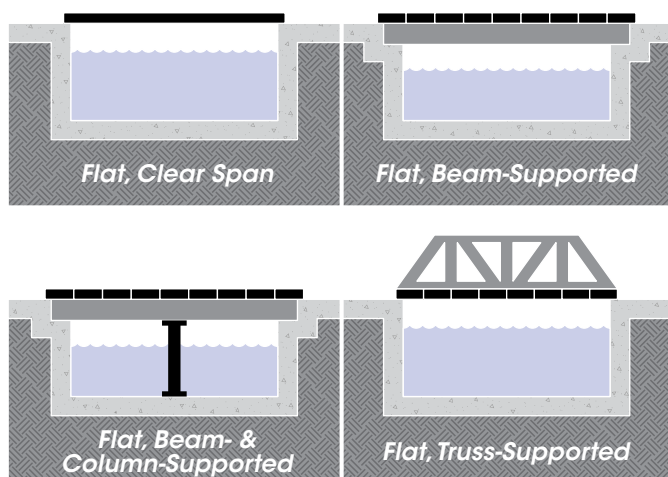
The XL6 system clears spans up to 20'. For longer span requirements, FRP beams and columns or truss members are utilized to support XL6 deck panels.

EASY, LOW-COST INSTALLATION

Factory-fabricated deck panels are simply laid in place and require only half of the cover panels to be fastened to supports.

- ▶ **Corrosion Resistant**
- ▶ **High Strength**
- ▶ **Lightweight**
- ▶ **UV Protection**
- ▶ **Turn Key Solutions**
- ▶ **Customized System**
- ▶ **Non-skid Surface**
- ▶ **Low Profile**

Configurations available for the XL6 tank cover



Gaskets at outer edges & panel joints control odors.



Inter-nesting XL6 panels are easy to remove & lift vertically.



Shop-fabricated panels include notched openings & self-contained access hatches.



1



2

Applications

- ▶ Headworks & Grit Covers
- ▶ Clarifiers
- ▶ Aeration & Equalization
- ▶ Sedimentation
- ▶ Sludge & Gravity Thickeners
- ▶ Chlorine Contact Basins
- ▶ Filtrate Storage Tanks
- ▶ Chemical Process Tanks



To learn more about the
XL6 Tank Cover System,
visit bit.ly/EnduroXL6

1. XL6 FRP Odor Control Tank Covers
2. XL6 clear span tank cover system with angle cut panels and access hatches over filtrate storage tanks
3. XL6 beam-supported cover - DAF cells. Cover panels can be handled by 2 workers alone.
4. XL6 clear span tank cover system with access hatches UV Disinfection Process
5. XL6 FRP Tank Cover over MBR Basins
6. XL3 FRP Clarifier Tank Covers replacing Metallic Covers Supported by External Truss Support System
7. XL6 beam supported covers with access hatches 53' x 60' Pre-treatment Tank Complex



3



4



5



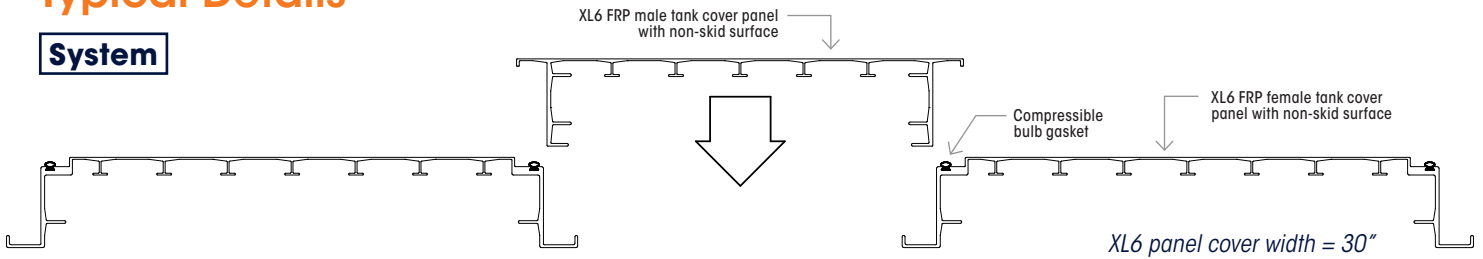
6



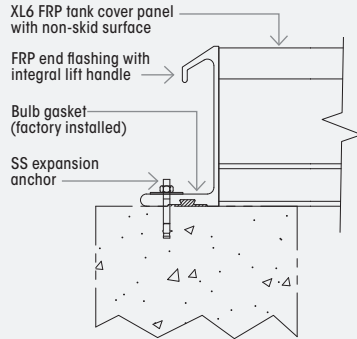
7

Typical Details

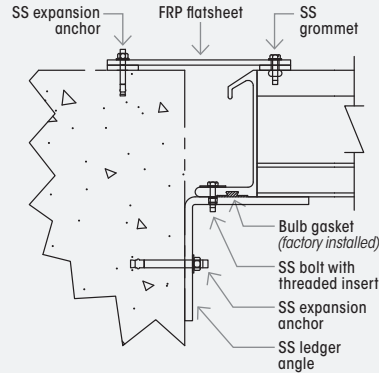
System



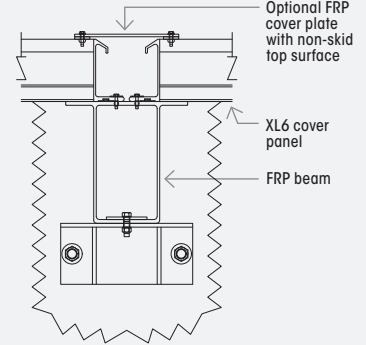
Concrete Wall



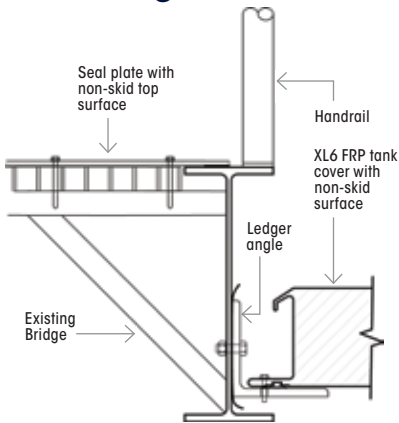
Flush Concrete Wall



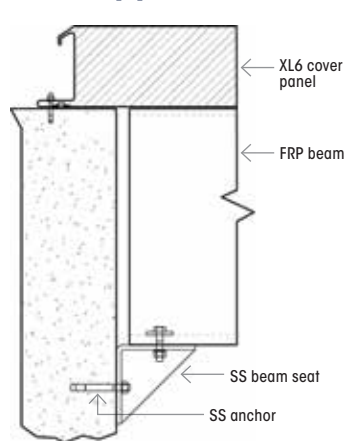
Beam End to End



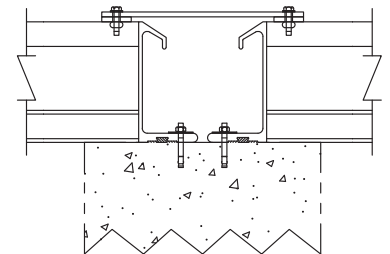
Steel Bridge



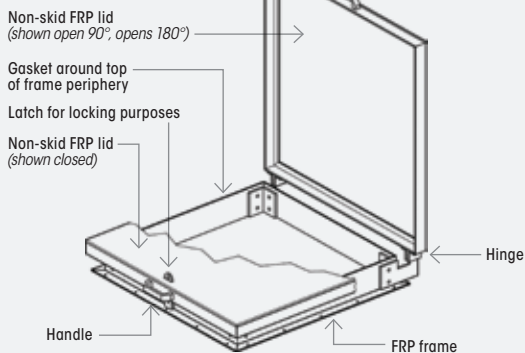
Beam-supported



Concrete Wall End-to-End



Hatch



Load Span Table

Maximum Allowable Load - Safety Factor = 2.5

Span	Uniform Live or Snow		Concentrated Load*
	L/D = 120	L/D = 180	L/D = 180
20 ft.	32 psf	26 psf	778 lbs
18 ft.	39 psf	36 psf	887 lbs
16 ft.	50 psf	50 psf	998 lbs
14 ft.	65 psf	65 psf	1141 lbs
12 ft.	89 psf	89 psf	1331 lbs

Concentrated load distributed over 1' x 2' area.

Specification

PART ONE: GENERAL

1.01 Description of Work

The scope of this specification shall include fiberglass reinforced plastic (FRP) flat tank covers which may consist of tank cover deck panels; structural supports; flashing and trim; fasteners and anchors; gaskets and sealant.

1.02 Quality Assurance

- A. Tank Cover supplier shall manufacture and fabricate all FRP components in its own facility, which must be based in USA and ISO 9001 certified.
- B. The manufacturer shall be solely responsible for the design, manufacturing, & fabrication of the cover system specified herein. No division of responsibility between manufacturer of components and design is implied or allowed.

1.03 Design Criteria

- A. Design Loads.
 1. Live or Snow: _____ psf
 2. Wind Uplift: _____ psf
 3. Dead Load: _____ psf
- B. Design Limits
 1. Dead + Live or Snow Load: Limit=L/120 (min); Factor of Safety=2.5
 2. Wind Uplift less Dead Load: Deflection Limit=L/60; Factor of Safety=1.88
 3. Personnel Load: Cover panels shall have 1/2" maximum deflection under 250 lb. concentrated load over 2.5 SF area located at mid-point of 20' clear span
- C. Air Leakage
 1. Air leakage shall not exceed 1 CFM/LF at gasketed panel joints and 2.2 CFM/LF at cover perimeter under .5 inch water pressure per HVAC Air Duct Leakage Test in accordance with NEBB "Procedural Standards for Adjusting, Balancing, of Environmental Systems".
- D. Cover Panel Removability
 1. Each cover panel shall be removable without having to remove no more than its two adjacent panels. Note: Each Enduro XL6 male panel can be removed individually.
 2. Each cover panel shall be removable vertically and without cutting of a cover component.

PART TWO: PRODUCTS

2.01 Manufacturer(s)

The standard for design, characteristics, and performance is Enduro XL6 Cover System as manufactured by Enduro Composites, Inc.

2.02 Materials

- A. Fiberglass reinforced plastic (FRP) structural components including decking, beams, and framing shall be manufactured by pultrusion process.
 1. Glass fiber reinforcements shall be minimum 50% of the material weight.
 2. Materials shall be fire retardant with flame spread rating of 25 or less per ASTM E84.
 3. Materials shall exhibit these Physical Properties (minimum):

Tensile Strength	40,000 psi	ASTM D 638
Compressive Strength	37,000 psi	ASTM D 695
Flexural Strength	45,000 psi	ASTM D 790
Flexural Modulus	1,690,000 psi	ASTM D 790
Izod Impact (Notched)	25	ASTM D 256
Water Absorption	.25% max	ASTM D 570
- B. XL6 Tank Cover Panels
 1. Resin type for FRP tank cover decking shall be UV stabilized, isophthalic polyester.

2. Deck panels shall be sealed at side-laps with factory in-stalled, non-adhesive, 1" diameter neoprene bulb gasket.
3. Each deck panel shall have vertical lifting handles that are integral, located at each end, and flush with top of panel.
4. Top of tank cover decking shall be flat and have a non-skid, UV resistant surface.
5. Color of deck panels shall be standard gray or beige (u.n.o).
- C. Hatches (if required)
 1. Hatches shall be raised with one-leaf hatch door and fabricated from pultruded fiberglass components.
 2. Access hatches shall be sized to fit inside a single deck panel so a panel with hatch can be removed without affecting adjacent panels.
 3. Underside of hatch lid shall be sealed with factory in-stalled, 3/8" diameter neoprene bulb gasket. Perimeter hatch curb shall be sealed to decking surface with sealant.
 4. (Optional): Hatches shall have a stainless steel, hold-open device to prevent door from blowing open or closing on itself.
 5. Hatches shall be secured with hand-operable latches and without special tools.
 6. Hatch lids shall have a non-skid, UV resistant surface with plastic or stainless steel lift handles.
 7. View port hatches shall be 12 inches square or less.
- D. FRP Structural Framing (if required)
 1. Resin type for FRP beams and framing members shall be UV stabilized, vinyl ester.
- E. Trusses (if required)
 1. Trusses shall be galvanized steel except where components are exposed to inside of tank. Components exposed to inside of tank shall be Stainless Steel (as suitable for the environment).
 2. Trusses shall have minimum 6" clearance from top of tank cover to bottom of top chord.
 3. Trusses shall be shipped in lengths up to 20' (as feasible) to be bolted together by contractor.
- F. Flashing and Trim
 1. Fiberglass flashing shall be isophthalic polyester.
 2. Non-radius, end flashing shall be factory attached to deck panels.
 3. Flashing with a radius or at perimeter of circular tank shall be a separate part and field attached by the contractor.
- G. Air Vents and Connections (if required)
 1. Gooseneck ventilation piping shall be FRP with plastic bird screen.
 2. Stub-vent connections shall be FRP with blind flange extending 6 inches (min) from top of tank cover.
- H. Pipe Penetrations
 1. Existing or new pipe penetrations shall be retrofitted by Contractor to penetrate cover at a 90-degree angle.
 2. Pipe penetrations shall be flashed in the field with a Sealite retrofit, zipper type, pipe flashing or equal.
- I. Hardware
 1. Fasteners, anchors, hinges, and other structural accessories located on the underside of cover shall be 304/316 Stainless Steel.
 2. Perimeter flashing anchors, concrete anchors, or other hardware not exposed to the inside environment of tank shall be 304 Stainless Steel.
- J. Gaskets and Sealants
 1. All panel side laps and perimeter conditions shall be gasketed.
 2. Sikaflex®-1A sealant shall be applied by Contractor at various locations as required for odor containment.

**Please visit bit.ly/XL6spec
for expanded specification.**



TuffSpan Tank Cover System & Enclosures

System Overview

Constructed with TuffSpan FRP building panels and FRP structural components, TuffSpan tank covers provide versatile configurations including low-profile, roof-type covers or raised, building-type covers.

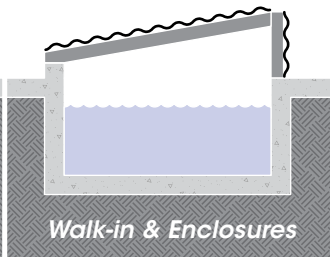
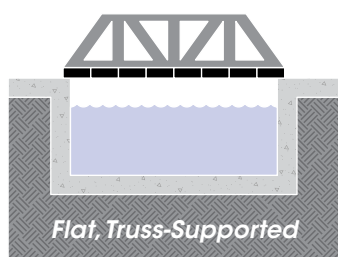
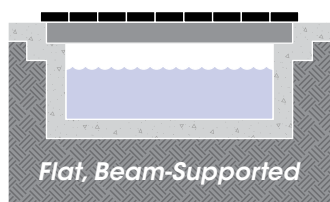
The TuffSpan low-profile covers are installed over storage and process tanks for UV screens and debris protection. TuffSpan raised covers and enclosures can provide walk-in access to processes.

TuffSpan cover components include TuffSpan FRP building panels, FRP beams, access hatches and stainless steel hardware.



*TuffSpan walk-in cover with FRP beams
UV Disinfection Process*

**Configurations
available for TuffSpan
tank covers**



Key TuffSpan Features & Advantages

WALK-IN ACCESS OPTION

For maximum process viewing, TuffSpan walk-in covers offer an ideal solution.

TRANSLUCENT OR OPAQUE COVER PANELS

TuffSpan Cover panels can be furnished in opaque color or translucent, which transmit natural lighting and can reduce energy bills.

EASY TO INSTALL

Our complete solution includes delivering pre-cut structural members and finished panel lengths for easy installation.

CUSTOM DESIGN & SPECIFICATIONS

With our full line of TuffSpan FRP structural building panels and shapes, our engineering and design team can assist with developing customized solutions for a broad range of conditions.

Please contact us for assistance with developing a tank cover or enclosure design and specification for your application and requirements.



*TuffSpan walk-in cover
with FRP beams*



*15 year-old
installation*



*TuffSpan truss-
supported cover*

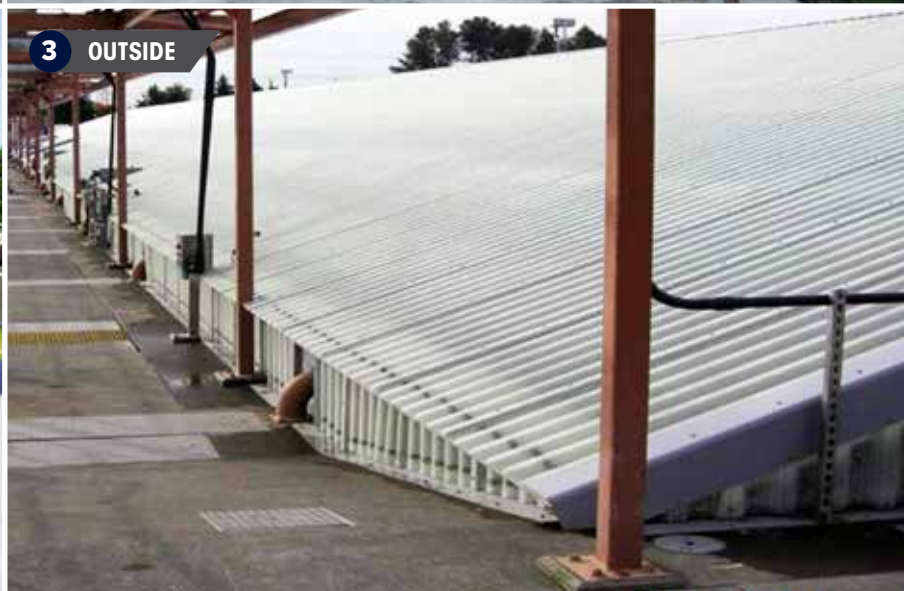
- ▶ Corrosion Resistant
- ▶ High Strength
- ▶ Lightweight
- ▶ UV Protection
- ▶ Turn Key Solutions
- ▶ Customized System
- ▶ Low Profile

TUFFSPAN TANK COVER SYSTEM & ENCLOSURES

Applications

- ▶ UV Screens
- ▶ Sludge Drying Beds
- ▶ Water Storage
- ▶ Chlorine Contact Basins
- ▶ Filtrate Storage Tanks
- ▶ Chemical Process Tanks

1. TuffSpan walk in tank cover system with FRP translucent panels, beams, platforms and doors. Top right photo shows the inside and middle right photo (#3) shows the outside. / Aeration Basin
2. TuffSpan removable enclosure with FRP panels, beams and louvers over floating aerator. Beam supported cover / Aeration Basin
3. Outside view of #1, above.
4. TuffSpan roof cover system / Sludge Drying Bed



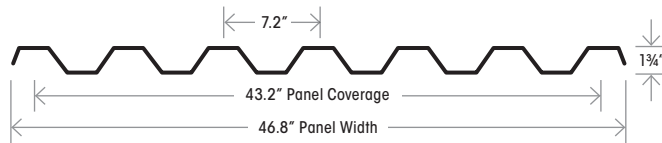
TuffSpan FRP Structural Components

Long recognized as leading FRP structural materials, TuffSpan building panels and beams are used as primary components in TuffSpan tank covers and walk-in enclosures.

The innovative structural shapes are also used as framing components in our tank covers and baffle wall. Utilizing cavity shapes for increased stability, lateral bracing needs for these beams can be eliminated. The sections have winged-flanges for easy-access, fastening locations.

In addition to the single profile and shapes shown below, we offer a full line of TuffSpan FRP building panels along with FRP pultruded angles, channels, shapes, and flat sheet. Many of these sections are used in our tank cover and baffle wall systems. **For additional information on TuffSpan building panels or our structural shapes, please contact us for a brochure or visit our website at CreativeCompositesGroup.com.**

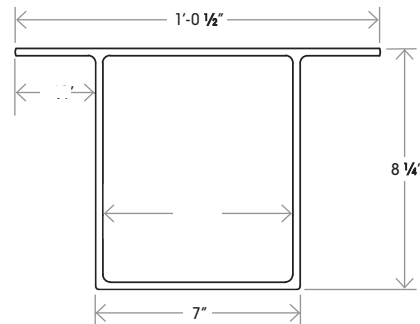
TuffSpan Panel 7.2D x 1.75 FR 450



Uniform Load PSF	20	30	40	50	60
Maximum 3 Span	10'6"	9'2"	8'4"	7'8"	7'3"

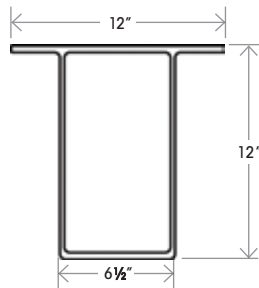
Maximum spans shown represent three span condition.
Deflection Limit = L/60; Factor of Safety = 2.5

8F7 Purlin / Girt



Allowable Uniform Load - Unbraced		
Positive Load, FOS = 2.5		
Span (Ft.)	L/D = 120 1	L/D = 180 1
16	380	253
18	269	179
20	197	131
22	149	99
24	115	77

12F12 Flanged Tube

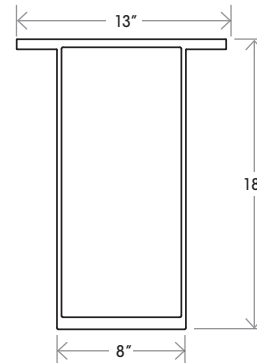


Allowable Uniform Load - Unbraced			Column Load	
Span (Ft.)	L/D = 120 1	L/D = 180 1	Lth (Ft.)	Axial (Lbs.)
22	496	331	7	50850
24	382	255	9	44285
26	300	200	11	39658
28	241	160	13	36176
30	196	130	15	33438
32	161	107	17	31214

BEAM FOS = 2.5

COL. FOS = 3

18F17 Flanged Tube



Allowable Uniform Load - Unbraced			Column Load	
Span (Ft.)	L/D = 120 1	L/D = 180 1	Lth (Ft.)	Axial (Lbs.)
32	521	429	12	69013
34	461	358	14	63403
36	412	302	16	58914
38	369	256	18	55218
40	330	220	20	52109

BEAM FOS = 2.5

COL. FOS = 3

FRP Structural Shapes

Flanged Beams

20 ft.
6" x 6" x 3/8" Wide Flange
8F6 Purlin/Girt
12F12 Flanged Tube
12S12 Flanged Tube
18F17 Flanged Tube

Flat Sheet

3' x 10' x 1/8" Thick
3' x 10' x 3/16" Thick
3' x 10' x 1/4" Thick
3' x 10' x 3/8" Thick
3' x 10' x 1/2" Thick
4 5/8' x 10' x 1/4" Strip

Channel

2" x 1" x 3/16"
3" x 1" x 3/16"
4" x 1 3/8" x 5/32"
4" x 1 1/8" x 1/4"
4 3/4" x 3 1/4" x 1/4"
6" x 1 5/8" x 5/32"
6" x 1 5/8" x 3/16"
6" x 2" x 3/16"
6" x 1 5/8" x 1/4"
6 7/8" x 5 3/8" x 1/4"
8" x 1 3/4" x 5/16"
10" x 2 3/4" x 3/8"

Angle

2" x 2" x 1/4"
3" x 3" x 1/4"
3" x 3" x 3/8"
4" x 4" x 3/8"
6" x 6" x 3/8"

Solid Rod

1" x 1/8" Square
1" x 1/8" Round

Square Tube

1 5/8" x 1 5/8" x 1/8"
2" x 2" x 1/4"
3" x 3" x 1/4"
4" x 4" x 1/4"

Round Tube

2 3/8" x 1/4"

Rectangular Tube

3" x 4" x 1/4"



FRP Structural Baffle & Partition Walls

Engineered for Water and Wastewater

Enduro FRP structural baffle and partition wall systems are specifically designed for potable water and wastewater treatment flow control. Our baffle and partition walls are pre-engineered systems composed of fiberglass reinforced plastic baffle panels, angles and framing members.

Enduro baffle wall systems offer industry-leading design flexibility in addition to a superior combination of strength and corrosion resistance.

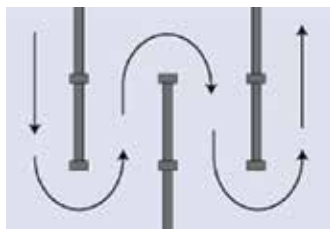
CERTIFIED TO NSF/ANSI STANDARD 61

All our baffle and partition wall systems are certified per NSF/ANSI Standard 61 for processing of potable water.

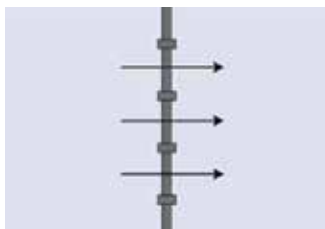
IDEAL FOR NEW OR RETROFIT BASINS

Our baffle and partition wall systems are an excellent choice for either new or retrofit basins. Their light weight makes them the perfect choice for retrofits, and their design flexibility makes them an excellent choice for new projects as well, allowing easy modification in the event of future process changes.

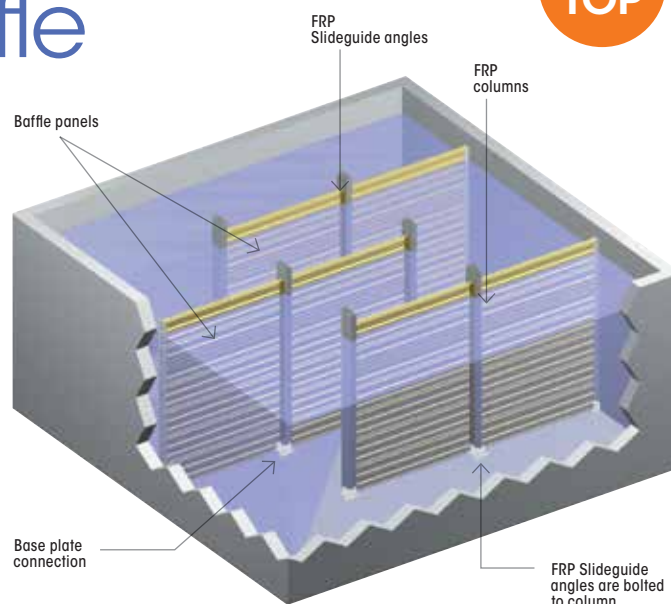
Baffles to control flow and increase residence time



Partition to separate zones or enhance mixing

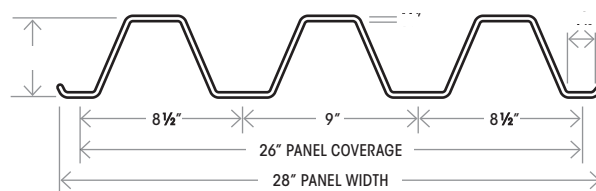
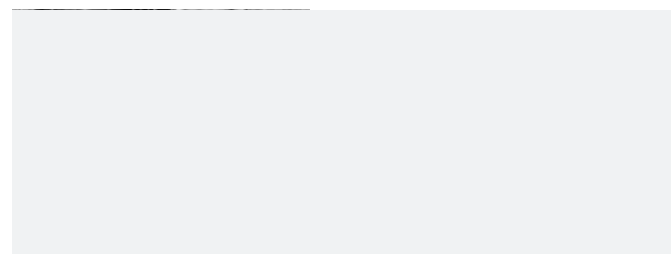


FRP SlideGuide "H" baffle series in aeration basin



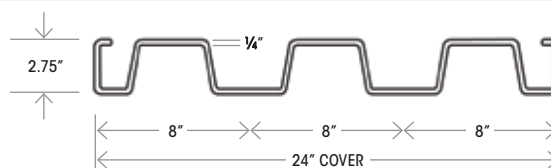
Typical baffle configuration: SlideGuide angles and base plates are typically prefabricated to columns. Concrete anchors for SlideGuide angles and column base plates shall be adhesive type 316 stainless steel.

Baffle & Partition Wall System Types



"H" Series System

- ▶ Long Span Baffles
- ▶ Bolted & Non-bolted Installation
- ▶ Panels Held in Place by Angles



Advantages of Well-designed FRP

CORROSION RESISTANCE

Designed for corrosive and challenging structural conditions, our baffle and partition walls deliver longer life than concrete, wood, steel or aluminum while eliminating maintenance.

HIGH STRENGTH

To ensure high strength and consistent quality, Enduro FRP structural components are manufactured by automated pultrusion process, which utilizes high glass-fiber content and results in unparalleled product consistency.

LIGHTWEIGHT

Weighing 90% less than a comparable concrete system, our FRP baffle wall can reduce loads on tank walls and floors. In addition, its lightweight also eases section removability and installation.

INCREASED BASIN VOLUME

With ¼" maximum thickness, Enduro baffle panels can take up 95% less basin volume compared to 6-8" thick concrete walls.

EASY RECONFIGURATION

If flow pattern adjustments are needed, our wall systems can be dismantled and relocated to accommodate changes in flow requirements.

System Design

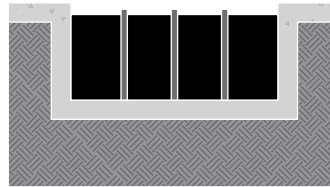
TURN KEY SOLUTIONS

Enduro offers a single-source responsibility and solution for design, manufacture and fabrication of FRP components. Components are manufactured in custom lengths and factory fabricated that can include pre-drilled holes and attachment of base plates and angles that minimizes field fabrication and installation.

CUSTOMIZED SYSTEM

With multiple wall types and system options, our experienced technical staff customizes the design to meet the requirements and needs for each project. Our baffle walls can include FRP baffle panels (solid or perforated), structural framing, baffle doors, and hardware.

Typical Configurations & Options



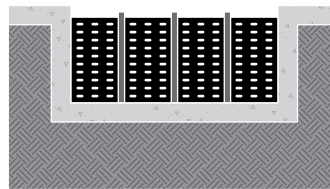
Cantilevered Column Wall

Non-braced columns may avoid interference with process equipment.



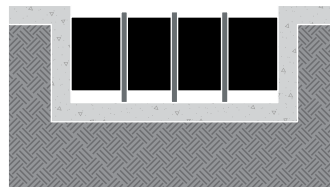
Integrated Roof

Baffle wall framing can be integrated with basin covers to reduce cost.



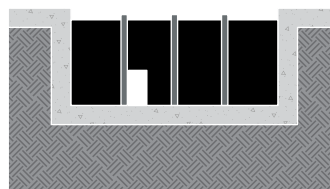
Perforated Wall

Baffle panels can be shop-perforated for increased water mixing and flow.



Solid Wall with Bottom Void

1-6" voids between baffle and basin bottom to ease sediment cleaning.



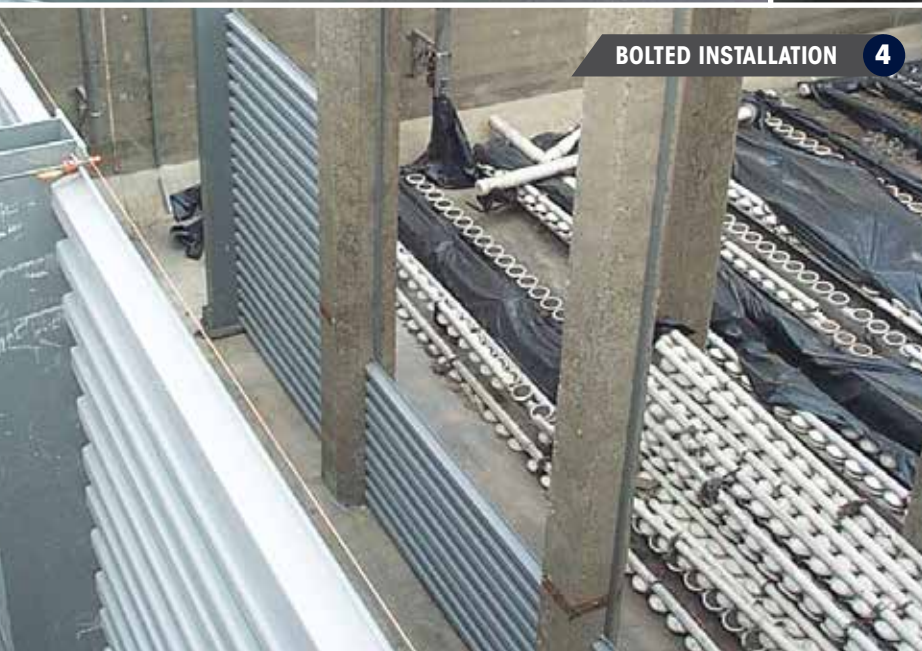
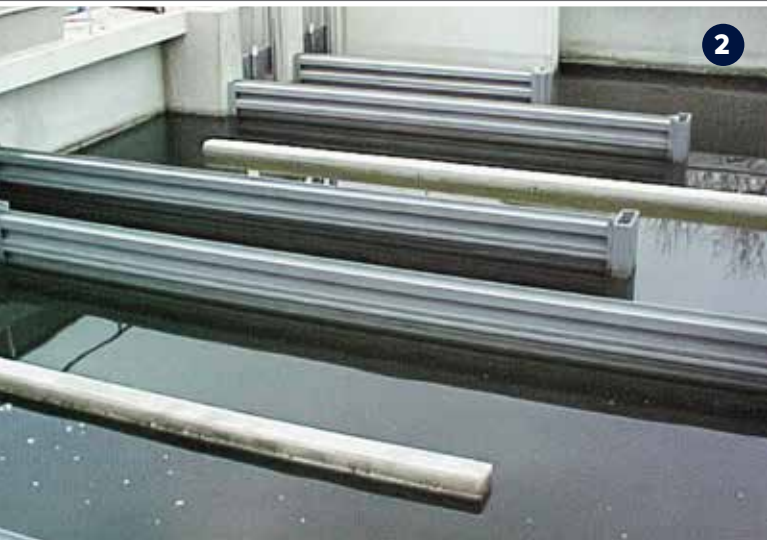
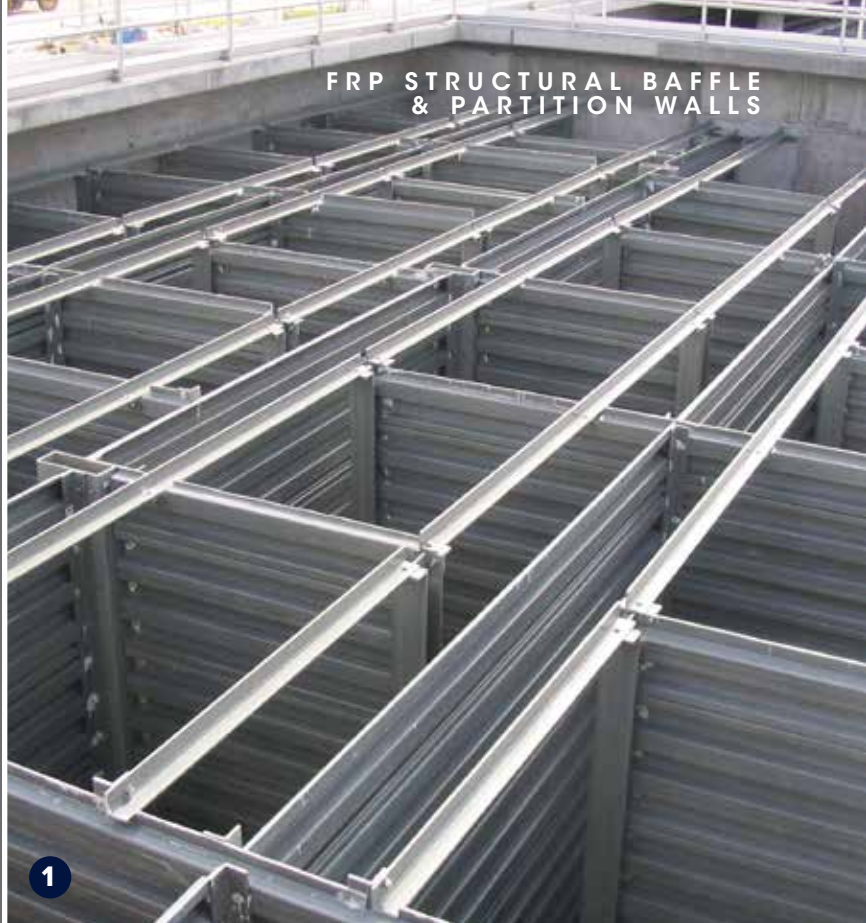
Doors

Baffle doors for man ways and access are available.

Applications

- ▶ Chlorine Contact Basins
- ▶ Flocculation Basins
- ▶ Sedimentation Basins
- ▶ Anoxic Zones
- ▶ Swing Zones
- ▶ Clearwells

1. Enduro "D" & "H" baffle wall systems with top braced FRP columns / Flocculation and Sedimentation Basin
2. Chlorine Contact Basin
3. Underground Clearwell
4. BOLTED INSTALLATION: "D" series baffle panels are nested at sides and fastened to supports. This system requires 50% less angle supports.
5. SLIDEGUIDE INSTALLATION: "H" series baffle panels are stacked from basin bottom to top and do not require fastening to supports.



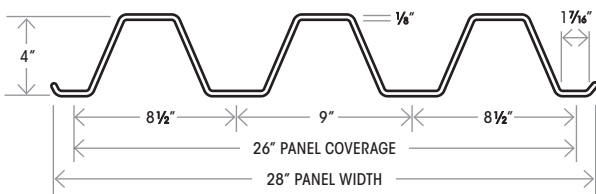
"D" Structural Baffle & Partition Walls

System Overview

To meet the need for a lower cost, FRP baffle panel that would effectively address rigidity and other structural requirements, we developed the "D" series panel.

With an advantaged strength to weight ratio, the 4" deep, profiled section has an extremely efficient design to address demanding wall requirements.

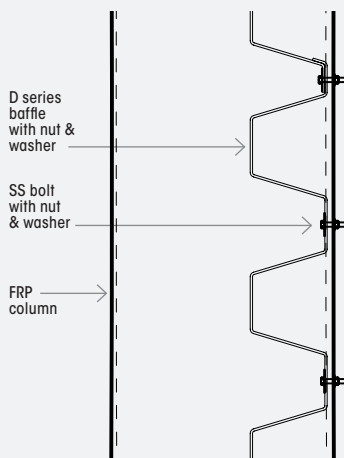
Designed for bolted installation, Enduro's "D" system has a proven track record of outstanding performance for numerous installations.



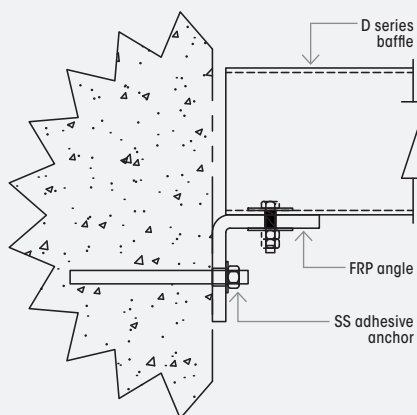
Flocculation Baffle Walls using Enduro Baffle D

Typical Details

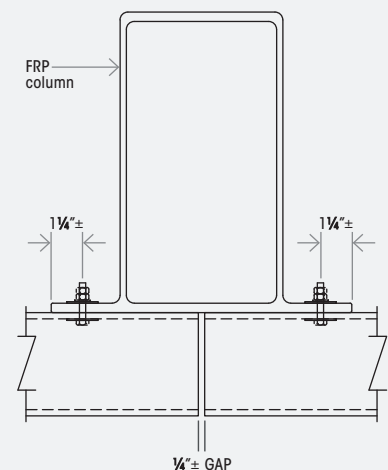
Panel Side Lap



Concrete Wall



12F12 FRP Column



Load Span Table

Water Differential	1"		2"		3"		4		5"		6"		8		10	
Uniform Load	5.2 psf		10.4 psf		15.6 psf		20.8 psf		26.0 psf		31.2 psf		41.6 psf		52.0 psf	
Span (Ft.)	L/D	FOS	L/D	FOS	L/D	FOS	L/D	FOS	L/D	FOS	L/D	FOS	L/D	FOS	L/D	FOS
8	>360	>6	>360	>6	>360	>6	280	>6	224	>6	187	>6	140	4.9	112	3.9
9	>360	>6	>360	>6	262	>6	197	>6	157	>6	131	5.2	98	3.9	79	3.1
10	>360	>6	287	>6	191	>6	143	>6	115	5.0	96	4.2	72	3.2		
11	>360	>6	215	>6	144	>6	108	5.2	86	4.2	72	3.5				
12	332	>6	166	>6	111	5.8	83	4.4	66	3.5						
13	261	>6	130	>6	87	5.0	65	3.7								
14	209	>6	104	>6	70	4.3										
15	170	>6	85	5.6												
16	140	>6	70	4.9												
17	117	>6														
18	98	>6														
19	84	>6														
20	72	>6														

Maximum spans are based on each panel being fastened with three (3) bolts to each support.

Specification FIBERGLASS REINFORCED PLASTIC BAFFLE WALL - D SERIES

PART ONE: GENERAL

1.01 Description of Work

The scope of this specification shall include materials for the fiberglass reinforced plastic (FRP) Baffle Wall System including FRP baffle wall panels; FRP columns; FRP angles; column base plates/angles; fasteners and connections.

1.02 Design Criteria

- Design Load (greater of water differential or wind load)
 - Water Differential: _____ in. (uniform load over wall)
 - Wind Load: _____ lbs./SF uniform load
- Deflection Limit and Factor of Safety
 - Baffle Panels: L/D=_____; Max Deflection=Panel Depth; FOS = 2.0
 - Columns: L/D=100; FOS=2.5

PART TWO: PRODUCTS

2.01 Manufacturer

Standard for design, characteristics, and performance is Enduro D Series Baffle Wall manufactured by Enduro Composites, Inc.

2.02 Materials

- FRP Baffle Panels, Columns, and Angles
 - FRP baffle panels, columns, angles, and associated components shall be ANSI/NSF Standard 61 certified for potable water application (as required).
 - FRP Baffle Panels shall exhibit these minimum properties:

Stiffness (EI)	5,591,000 lb-in ² /ft
Moment Capacity	19,700 lb-in/ft

- FRP structural materials shall exhibit these minimum properties:

Tensile Strength	40,000 psi	ASTM D 638
Flexural Strength	33,000 psi	ASTM D 790
Flexural Modulus	1,037,000 psi	ASTM D 790
Izod Impact (Notched)	15	ASTM D 256
Water Absorption	.20% max	ASTM D 570

- FRP Materials shall include UV stabilized polyester resin; surfacing veil at top and bottom sides; gray color.
- Factory cut edges and drilled holes shall be sealed with ANSI/NSF approved material.
- FRP baffle panels shall be Enduro Series D, 4 x .125 profile; 4" depth; 1/8" nominal thickness; 40% glass fiber reinforcing (by wt.); with top, horizontal ribs sloped downward not less than 10 degrees to minimize sediment build-up.
- FRP Columns shall be Enduro Type _____ with 50% glass fiber reinforcing (by wt.). Column base plates or angles shall be 304/316 Stainless Steel.
- FRP Angles shall be 3/8" thick and 90 degrees.
- Hardware
 - Fasteners, anchors, and other structural hardware shall be 304/316 Stainless Steel.
 - Submerged anchors shall be epoxy adhesive type.

**Please visit bit.ly/DBaffleSpec
for expanded specification.**

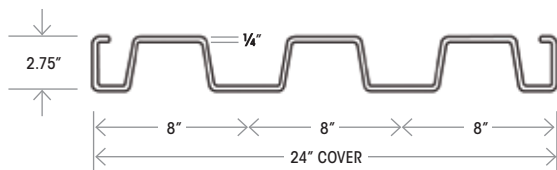


"H" Structural Baffle & Partition Walls

System Overview

As a global leader for FRP structural systems, Enduro developed the "H" Series baffle panel and the innovative SlideGuide assembly system.

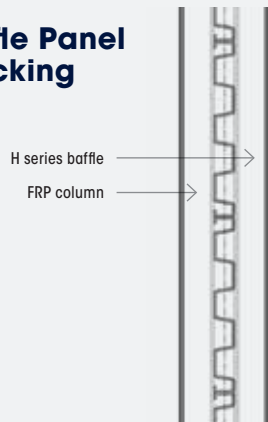
The 1/4" thick "H" series panels are the strongest FRP baffle panels available and are utilized in both bolted and non-bolted installations. In the SlideGuide system, the "H" baffle panels, which do not require fastening, are inserted between and held in place by FRP angles. With a long and proven track record of outstanding performance, the Enduro "H" series and SlideGuide assembly has led a movement away from concrete and wood to our FRP baffle system.



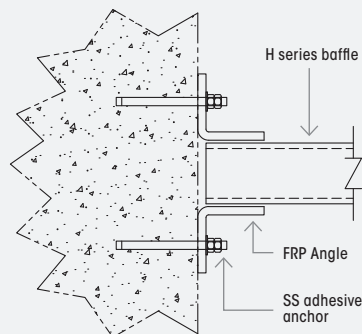
Enduro "H" slotted flow-thru baffle wall system / Settling Basin

Typical Details

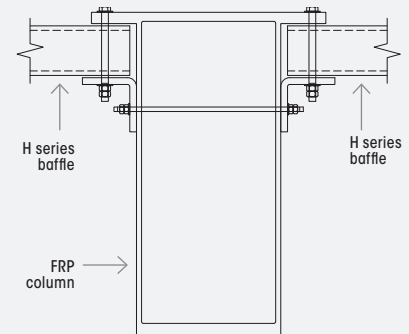
Baffle Panel Stacking



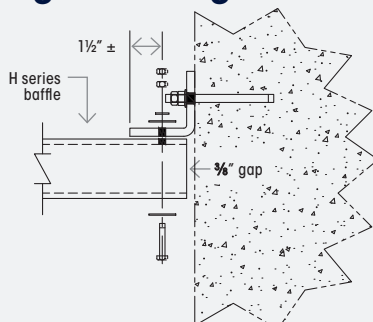
SlideGuide Concrete Wall



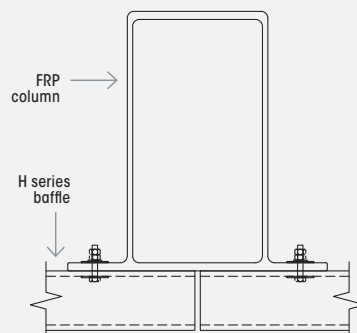
SlideGuide 12F12 FRP Column



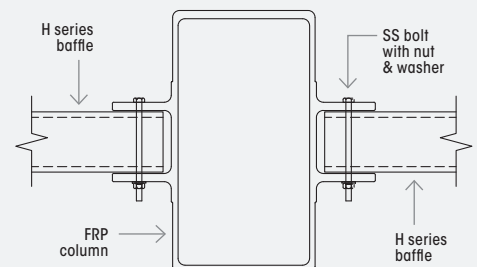
Single Wall Angle



Bolted 12F12 FRP Column



Bolted 12F12 FRP Column



Load Span Table

Water Differential	2"		3"		4		5"		6"		8		10		12	
Uniform Load	10.4 psf		15.6 psf		20.8 psf		26.0 psf		31.2 psf		41.6 psf		52.0 psf		62.4 psf	
Span (Ft.)	L/D	FOS	L/D	FOS	L/D	FOS	L/D	FOS	L/D	FOS	L/D	FOS	L/D	FOS	L/D	FOS
9	>360	>6	>360	>6	>360	>6	>360	>6	>360	>6	309	>6	247	>6	206	5.2
10	>360	>6	>360	>6	>360	>6	>360	>6	300	>6	225	>6	180	5.0	150	4.2
11	>360	>6	>360	>6	339	>6	271	>6	226	>6	169	5.2	135	4.2	113	3.5
12	>360	>6	348	>6	261	>6	209	>6	174	5.8	130	4.4	104	3.5		
13	>360	>6	273	>6	205	>6	164	5.9	137	5.1	103	3.7				
14	328	>6	219	>6	164	>6	131	5.1	109	4.5						
15	267	>6	178	>6	134	5.6	107	4.5								
16	220	>6	147	>6	110	4.9										
17	183	>6	122	5.8	92	4.3										
18	155	>6	103	5.2												
19	131	>6														
20	113	>6														
21	97	5.7														

Maximum spans are based on non-fixed connection with panels being restrained by SlideGuide angles on each side. Please contact Enduro for Load/Span data with a bolted H Series installation.

Specification FIBERGLASS REINFORCED PLASTIC BAFFLE WALL - H SERIES

PART ONE: GENERAL

1.01 Description of Work

The scope of this specification shall include materials for the fiberglass reinforced plastic (FRP) Baffle Wall System including FRP baffle wall panels; FRP columns; FRP angles; column base plates/angles; fasteners and connections.

1.02 Design Criteria

- Design Load (greater of water differential or wind load)
 - Water Differential: _____ in. (uniform load over wall)
 - Wind Load: _____ lbs./SF uniform load
- Deflection Limit and Factor of Safety
 - Baffle Panels: L/D=_____; Max Deflection=Panel Depth; FOS = 2.0
 - Columns: L/D=100; FOS=2.5

PART TWO: PRODUCTS

2.01 Manufacturer(s)

Standard for design, characteristics, and performance is Enduro H Series Baffle Wall manufactured by Enduro Composites, Inc.

2.02 Materials

- FRP Baffle Panels, Columns, and Angles
 - FRP baffle panels, columns, angles, and associated components shall be ANSI/NSF Standard 61 certified for potable water application (as required).
 - FRP Baffle Panels shall exhibit these minimum properties:

Stiffness (EI)	17,500,000 lb-in ² /ft
Moment Capacity	99,000 lb-in/ft

- FRP structural materials shall exhibit these minimum properties:

Tensile Strength	48,000 psi	ASTM D 638
Flexural Strength	58,000 psi	ASTM D 790
Flexural Modulus	3,210,000 psi	ASTM D 790
Izod Impact (Notched)	25	ASTM D 256
Water Absorption	.20% max	ASTM D 570

- FRP Materials shall include UV stabilized polyester resin; surfacing veil at top and bottom sides; gray color.
- Factory cut edges and drilled holes shall be sealed with ANSI/NSF approved material.
- FRP baffle panels shall be Enduro Series H, 2.75 x .25 profile; 2.75" depth; 1/4" nominal thickness; 50% glass fiber reinforcing (by wt.); with top, horizontal ribs sloped downward not less than 10 degrees to minimize sediment build-up.
- FRP Columns shall be Enduro Type _____ with 50% glass fiber reinforcing (by wt.). Column base plates or angles shall be 304/316 Stainless Steel.
- FRP Angles shall be 3/8" thick and 90 degrees.
- Hardware
 - Fasteners, anchors, and other structural hardware shall be 304/316 Stainless Steel.
 - Submerged anchors shall be epoxy adhesive type.

Please visit bit.ly/HBaffleSpec for expanded specification.



PulTex®

Fiber Reinforced Sludge Flights

ADVANTAGES OVER TRADITIONAL MATERIALS

Durability:

FRP can withstand chemical exposure without rusting or degrading, unlike steel options.

Installation Efficiency:

The lightweight nature makes handling and installation easier, often reducing labor costs.

Operational Efficiency:

The low friction surface can improve the movement of sludge, enhancing overall process efficiency.

Customization:

The availability of multiple profiles allows for optimized designs specific to the treatment plant's needs.

Uses

- ▶ Clarifiers
- ▶ Digesters
- ▶ Thickeners

Features

- ▶ Integral Scraping Lip
- ▶ Versatile

Benefits

- ▶ Lowest Lifetime Cost of Ownership
- ▶ Low Maintenance



1500 Series *Thermoset Polyester – Light Gray*

WASTEWATER SLUDGE FLIGHTS MADE OF FRP

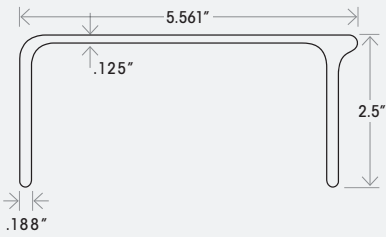
Fiberglass Reinforced Polymer (FRP) sludge flights are specialized components used in wastewater treatment processes. CCG's composite sludge flights represent a modern solution in wastewater treatment, contributing to more efficient and durable components for managing sludge. PulTex flights and scraper blades are made of pultruded fiberglass reinforced polyester. Flights are supplied to any length and predrilled per customer specifications. They are UV resistant and have excellent deflection and twist strength. The benefits of using composites include best-in-class mechanical properties and corrosion resistance.



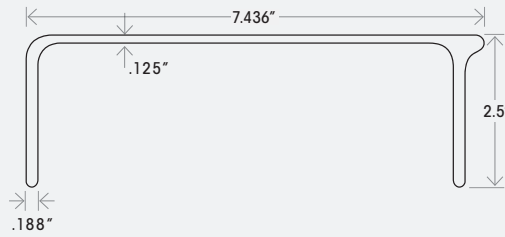
Sludge flights installed in a Clarifier Tank.

Profiles & Dimensions

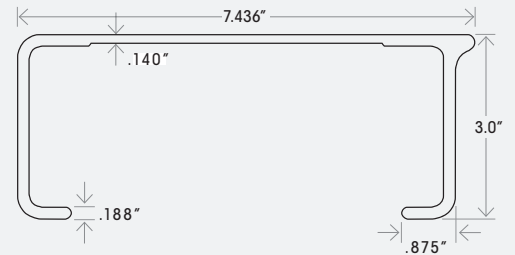
3" x 6" Channel



3" x 8" Channel



3" x 8" Ultra



General Properties

Flight Profile/Size	Full Section Weak Axis Flexural Modulus per ASTM D8069	Full Section Weak Axis Flexural Strength per ASTM D8069	Strong Axis Moment of Inertia in ⁴	Weak Axis Moment of Inertia in ⁴	Density lbs/in ³ (nominal, +/- 0.005 lbs/in ³)	Specific Gravity	Weak Axis Stiffness (lb in ²)
3" x 6" Channel	5.1E+06 psi	30,000 psi	7.813	1.02	0.07	1.80 - 2.08	5.20E+06
3" x 8" Channel	5.1E+06 psi	30,000 psi	15.589	1.114	0.07	1.80 - 2.08	5.68E+06
3" x 8" Ultra	4.0E+06 psi	30,000 psi	20.601	2.79	0.067	1.72 - 1.99	1.12E+07

Other minimum properties applicable to all sizes of flights, based on coupon testing values.

All material properties listed in the table below are characteristic values following ASTM D7290 statistical analysis, based on mechanical testing performed by the CCG Quality Assurance Laboratory.

Property	Specification	Units	Value
Tensile Strength (Longitudinal)	ASTM D638	psi	43,000
Tensile Strength (Transverse)	ASTM D638	psi	4,500
Tensile Modulus (Longitudinal)	ASTM D638	psi	3.20E+06
Flexural Strength (Longitudinal)	ASTM D790	psi	38,000
Flexural Strength (Transverse)	ASTM D790	psi	9,500
Flexural Modulus (Longitudinal)	ASTM D638	psi	1.70E+06
Compressive Strength (Longitudinal)	ASTM D695	psi	17,000
Compressive Strength (Transverse)	ASTM D695	psi	8,900
Water Absorption – maximum, 73° F, 24 hrs.	ASTM D570	%	0.60%
Minimum Glass Content, by weight %	ASTM D2584	%	55%
Shear Strength (by punch tool)	ASTM D732	psi	8,500
Barcol Hardness, min.	ASTM D2583-81	Barcol	46

Tolerances:

Squareness of end cut: Maximum deviation is 1°

Angularity: ±2°

Length: ±1/8" up to 20'-0" lg.

Flatness: Maximum deviation from flat is .008" x inch of width.

Twist: 3° maximum up to 20'-0" lg.

Warpage: .030"/ft. of part length for parts 20 ft. and under. For parts longer than 20 ft., .050"/ft. of part length with a maximum deviation of 1.250". The non-lip side is a maximum of .375" for all part lengths. All warpage is checked with no weight minimizing the warp.



CLARIFIER PRODUCTS

Enduro's suite of wastewater clarifier products are high-strength and corrosion-resistant, capable of withstanding the harsh conditions in wastewater treatment facilities. We are a single-source solution for all your clarifier product needs.

- ▶ Fiberglass Launder Covers
- ▶ Walkable Fiberglass Launder Covers
- ▶ Fiberglass Weirs and Scum Baffles
- ▶ Fiberglass Launder Trough Systems
- ▶ Sludge Flights



INDUSTRIES & PRODUCTS

Creative Composites Group can help you advance your infrastructure projects beyond the limitations of traditional materials. We are the largest manufacturer of structural composites in the U.S. with innovative products across multiple industries.



BRIDGES

Our FRP bridge decking for pedestrian and cantilever applications has many advantages over other materials due to its light weight and unmatched resiliency.



BUILDING PRODUCTS

Our building materials offer a total corrosion resistant structural solution for industrial and commercial applications.



ELECTRICAL & CABLE MANAGEMENT

We manufacture cable and wire management systems including cable tray, wireway, conduit and elbows that perform in the most demanding environments.



MASS TRANSIT & RAIL

Our FRP rail platform systems are state of the art and significantly extend the life span of railway transit platforms.



OEM & CUSTOM COMPOSITES

CCG's custom manufacturing capabilities include pultrusion, continuous lamination, vacuum infusion, hand layup and filament winding.



TELECOM & DATA CENTERS

Our composite telecom and data center products are engineered for advance data applications and provide robust protection for your infrastructure.



POWER TRANSMISSION & DISTRIBUTION

We design and manufacture products for various utility infrastructure applications including poles for: transmission, distribution, camera, roadway/street lighting and municipal lighting.



WATERFRONT INFRASTRUCTURE

We design and manufacture composite waterfront infrastructure products, such as camels, sheet piles, pipe piles, fender systems and custom marine products.



WATER & WASTEWATER

We design and manufacture water and wastewater products to withstand challenging environmental conditions and enhance treatment plant performance for both municipal and industrial applications.



CREATIVE
COMPOSITES
GROUP®

Enduro Composites

(800) 231-7271

16602 Central Green Blvd., Houston, TX 77032

Creative Pultrusions

214 Industrial Lane, Alum Bank, PA 15521

CreativeCompositesGroup.com

DLR07082026R1

©2026 Creative Composites Group
All Rights Reserved Worldwide

