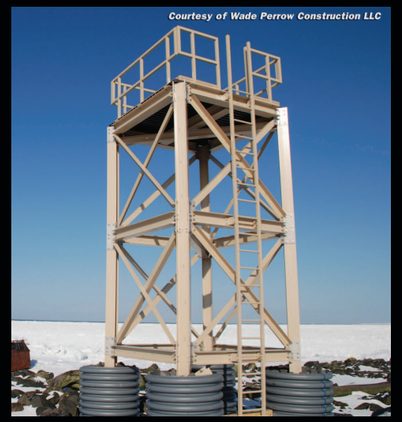
STRONGWELL®

Fiberglass Building Solutions

PULTRUSION POWER

Contents

STRONGRAIL® Fencing | Tulsa, OK



Arctic Seal Observatory Towers | St. Paul Island, AK

36" (914.4mm) EXTREN® Double Web Beam

STRONGWELL

G. David Oakley
President & CEO

Company Overview

Strongwell is the world's largest pultrusion company and the recognized leader in the pultrusion industry. Strongwell has pultruded fiber reinforced polymer (FRP) composite structural products since 1956 and remains active in product, process and market development programs. Today, Strongwell has more than 65 pultrusion machines in three ISO 9001:2008 quality certified and ISO 14001 environmentally certified plant locations for a total of in 645,000 sq. ft. (59,922 m^2) of manufacturing space. Strongwell also houses a 10,000 sq. ft. laboratory with ASTM testing capabilities. These features allow Strongwell to offer unequaled capacity, versatility and flexibility to meet the needs of its customers and allied partners.

Fiberglass Cooling Tower

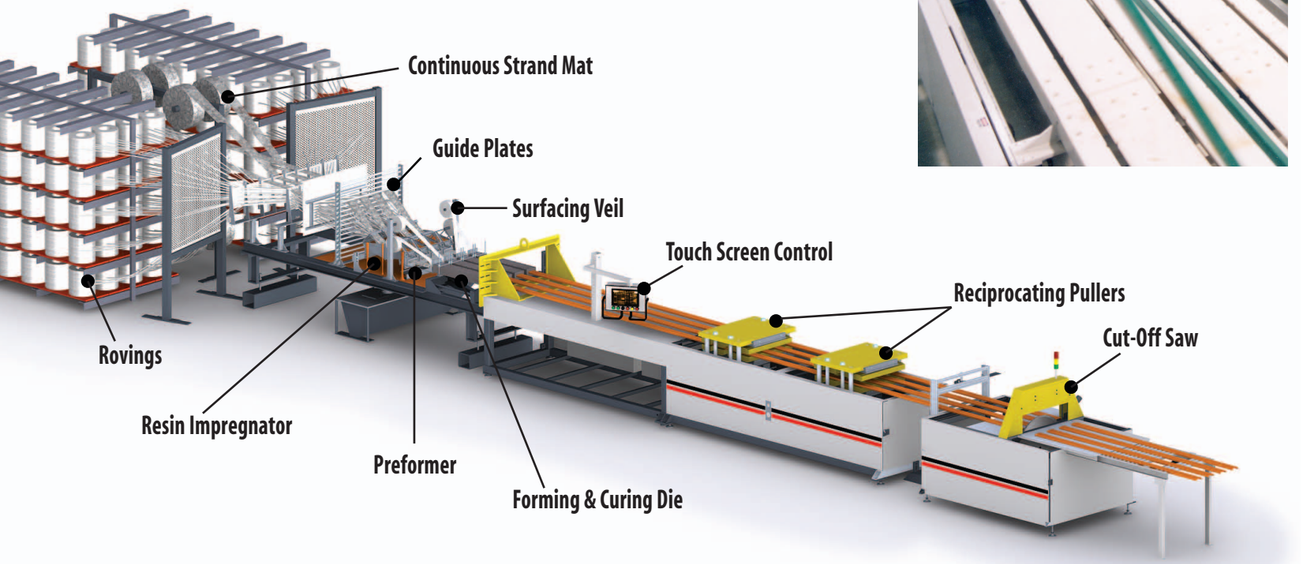
Strongwell's success is a direct result of a strong team and diverse products offered in a wide variety of markets. No other pultruder offers such a broad product range. From structural shapes and building panel systems to handrail and grating to complete fabricated structures, Strongwell is the one-stop source for any structural fiberglass needs!

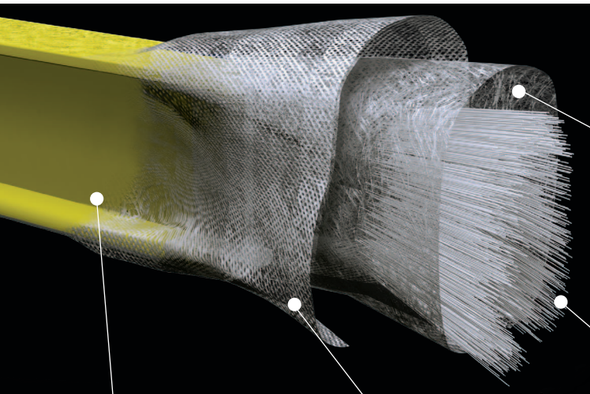
Strongwell's expertise in pultrusion design, engineering and manufacturing allows it to offer unique solutions to meet the customer's exact requirements. Strongwell uses award-winning pultrusion processes and unmatched production capacity at the company's Bristol, Virginia, Abingdon, Virginia and Chatfield, Minnesota manufacturing facilities.

Today, Strongwell continues to add capacity, diversify its product lines, increase engineering capability and improve its processes and products.

The
Pultrusion Process

Pultrusion is a manufacturing process for producing continuous lengths of fiber reinforced polymer (FRP) structural shapes with constant cross-sections. Raw materials are a liquid **resin** mixture (containing resin, fillers and specialized additives), continuous glass fiber filaments known as **rovings**, chopped filaments called **continuous strand mat** and a protective fabric known as **surfacing veil**. The pultrusion process involves pulling these raw materials (rather than pushing, as is the case in extrusion) through a heated **forming & curing die** using a continuous **pulling system**. While pultrusion machine design varies with part geometry, the basic pultrusion process concept is described in the illustration below.

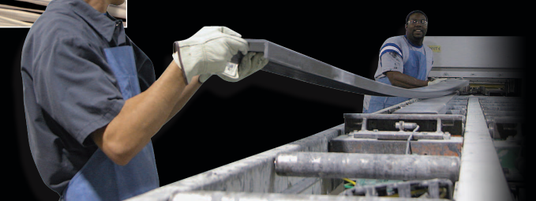




Continuous Strand Mat

Rovings

The reinforcement materials are in continuous forms such as rolls of continuous strand mat and doffs of fiberglass roving. As the reinforcements are saturated with the resin mixture ("wet-out") in the resin bath and pulled through the die, the gelation, or hardening, of the resin is initiated by the heat from the die and a rigid, cured profile is formed that corresponds to the shape of the forming and curing die.



Benefits of
Pultruded Fiberglass

Corrosion Resistance
Superior resistance to a broad range of chemicals. Unaffected by moisture or immersion in water when sealed. Will not rust like metal and will not rot like wood.

High Strength
Stronger than steel and aluminum, pound-for-pound in lengthwise direction.

Lightweight
Pultruded fiberglass shapes generally weigh 75-80% less than simlar steel shapes and 30% less than similar aluminum shapes.

Low Conductivity
Low electrical and thermal conductivity properties and high dielectric capability.

EMI & RFI Transparency
Transparent to electromagnetic and radio frequency interference. Certified by Los Angeles Research Report, L.A.R.R., for use in RF transparent screening and enclosure systems.

Virtually Maintenance Free
Will not permanently deform under impact. Corrosion resistance eliminates need for constant painting and upkeep. Provides long-term, cost effective solutions with lower life cycle costs.

Easy Installation
Can be field fabricated using simple carpenter tools and is easily lifted into place during installation.

Versatility
FRP can be pultruded in a wide variety of profiles for many different markets. Multiple resin types and custom color options are available.

Selected Markets

- Architecture
- Marinas & Docks
- Chemical
- Recreation/Water Play
- Cooling Tower
- Hotel, Motel & Restaurant
- Transportation
- Utility
- Armor & Security
- Offshore Oil & Gas
- Water/Wastewater Treatment
- Electrical
- Mining
- Coastal Construction
- Arctic/Harsh Environment
- Industrial

Strongwell manufactures and fabricates problem-solving products for wide variety of markets and specific applications. The selected markets listed above are typical of where pultrusions are being utilized.

The POWER of

STRONGWELL'S CAPABILITIES

CAPACITY

Strongwell is the world leader in pultrusion of fiber reinforced polymer structural composites. The company's three plants contain more than 65 pultrusion machines, with single machines capable of pulling small parts up to 40 lines, or large parts as wide as 5 ft. (1.5 m) and as high as 3 ft. (0.9 m). Strongwell has numerous multi-cavity pultrusion machines that allow for efficient multi-line production on a single machine. Multi-cavity machines allow Strongwell to increase capacity and shorten lead times for special orders.

ENGINEERING

Strongwell has virtually every engineering discipline on staff including multiple registered professional structural engineers. Finite Element Analysis capability is available in-house.

FABRICATION

Strongwell's extensive experience in fabrication procedures, joint design and stress analysis of composite assemblies, combined with the use of Strongwell's fiber reinforced products, result in structures of superior, cost-effective design and structural integrity. Strongwell can furnish custom fabricated assemblies based upon customer drawings. Individual parts can also be fabricated to produce specialized parts for custom applications.

Bristol Division | Bristol, VA

Chatfield Division | Chatfield, MN

Highlands Division | Abingdon, VA

Strongwell's fabrication services include cutting, drilling, routing, grinding, coating and painting. Strongwell can perform many secondary operations on pultruded parts using CNC equipment. These operations include vertical and horizontal drilling, machining, cutting and routing. Customers benefit from this additional service because it adds value to the part and provides a product that will precisely meet the specifications and end use.

RESEARCH & DEVELOPMENT

Strongwell's Bristol Division houses a 10,000 sq.ft. (929 m^2) laboratory for ASTM structural and electrical testing and a modern in-house machine shop for design and build of advanced pultrusion machinery, tooling and dies.

The POWER of

FABRICATED STRUCTURES

Strongwell has substantial capability to add value to pultruded parts including the fabrication and shop assembly of parts, components, sub-assemblies and entire shop-built structures. The fabrication group is supported by a strong engineering team including registered professional structural engineers experienced in FRP design and AutoCAD detailers who translate requirements into shop drawings.

Strongwell fabricates fiberglass structures at both the Bristol and Chatfield Divisions. Typical fabrications include beam, column and plate structures, all-fiberglass buildings using foam core panels, platforms and decking products as well as other custom fabrications involving grating and handrail. Find easy-to-complete fabrication worksheets on Strongwell's website to receive a quote for your upcoming fabricated project!

Mountaintop Park Super Structure | Stone Mountain, GA

RF Transparent Rooftop Structure | Orlando, FL

Structural Solutions from Concept to Completion!

Platforms and Walkways, Raised Floor Systems, Loading Platforms, Ladder & Cage Systems, All-fiberglass Buildings, Structures & Enclosures, Water/Wastewater Products, Architectural Applications, Pollution Control Products, Equipment/Facilities, Structures, Roofs, Covers & more.

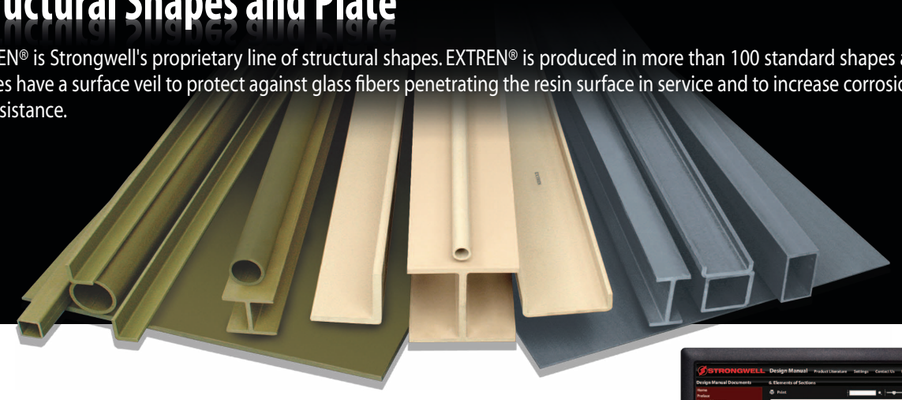
Cooling Tower Structure | Florida

Screening Pyramids | Indian Wells, CA

Waterpark Structure

The POWER of EXTREN®
Structural Shapes and Plate

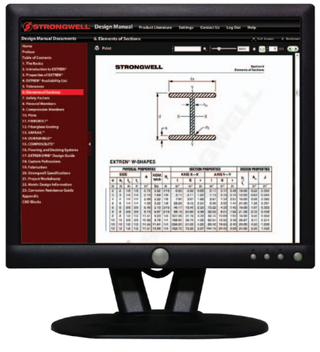
EXTREN® is Strongwell's proprietary line of structural shapes. EXTREN® is produced in more than 100 standard shapes and all shapes have a surface veil to protect against glass fibers penetrating the resin surface in service and to increase corrosion and UV resistance.



Today, EXTREN® is increasingly replacing steel, aluminum, and wood in a wide variety of structural applications. Why? Because EXTREN® is a problem solving material.

EXTREN® is :

- Corrosion Resistant
- Low in Conductivity - Thermally and Electrically
- Nonmagnetic - Electromagnetic Transparency
- Lightweight - Weighs 80% less than Steel
- High Strength
- Dimensional Stability
- Low Maintenance
- Custom Colors

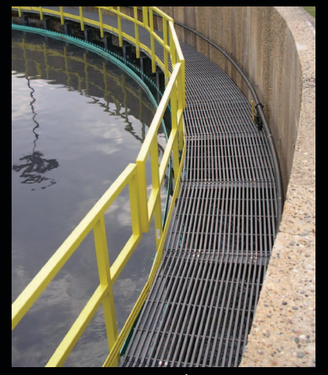


The Strongwell Design Manual contains more than 400 pages of engineering data for the design engineer. The manual is based on years of manufacturing experience, extensive product testing and structural design and fabrication experience from Strongwell and numerous academic institutions. Access the online version of the Strongwell Design Manual with ease by logging on to Strongwell.com.

The POWER of DURADEK®
Standard Pultruded Grating

DURADEK® is a standard pultruded grating stocked by distributors nationwide. DURADEK® is available with individual bearing bars in either 1″(25.4mm) or 1-1/2″(38.1mm) "I" shapes or a 2″(50.8mm) "T" shape. The grating design implements a 3-piece cross-rod system and Strongwell's proprietary bonding method ties the bearing bars together to provide superior stability on the grating panel. DURADEK® is a flame retardant product utilizing a polyester or vinyl ester resin. The bearing bars use both longitudinal (glass roving) and multidirectional (glass mat) reinforcements as well as a synthetic surfacing veil to provide unequaled corrosion resistance.

Pier Walkways | Dinner Key Marina, FL



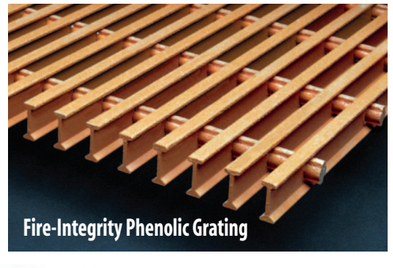
Water Treatment Plant | Albert Lea, MN

The POWER of DURAGRID®
Custom Pultruded Grating

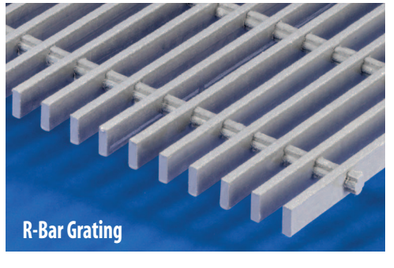
DURAGRID® custom grid and grating systems are designed to accommodate specific applications that cannot effectively be met by a standard fiberglass grating. DURAGRID® offers the customer options such as selection of bar spacing (which creates varying open space in the grating or grid), bar shape, cross-rod placement, custom fabrication, custom resin or color.

Patio Decking | Muirfield Village, OH

HD Grating



Fire-Integrity Phenolic Grating



R-Bar Grating

Cooling Tower | Benson, MO

WWTP Baffle Panels | Greeneville, TN

The POWER of COMPOSOLITE®

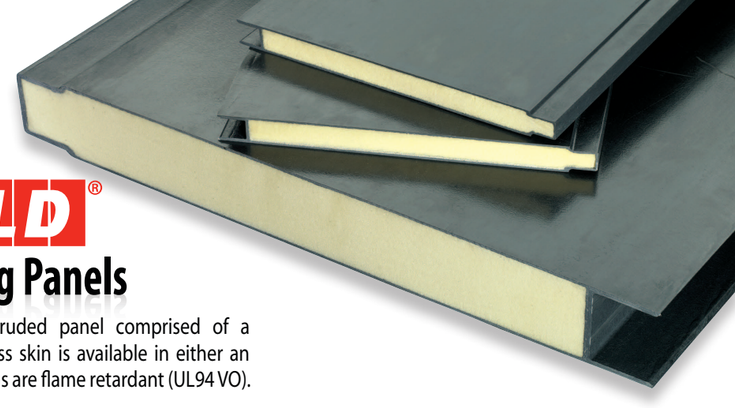
Fiberglass Building Panel System

COMPOSOLITE® is an advanced composite building panel system suitable for major load bearing structural applications. The system combines manufacturing simplicity with an almost unlimited number of configurations. The modular construction system consists of six interlocking components. The main component is a 3" (76.2mm) thick x 24" (609.6mm) wide open-ribbed building panel. Three-way and 45° connectors allow the system components to turn corners and facilitate the joining of walls or sides. Toggles lock panels and connectors together securely. For added flexibility, the system also includes a hanger and an end cap. For permanent structures, joints between panels and connectors are bonded during assembly. This uniquely designed system of interlocking components makes it possible to design fiberglass structures for a broad range of construction applications with an almost unlimited number of configurations.

Bascule Bridge | Barbados

Odor Control Covers | Denver, CO

Safety Yellow Scaffolding | Driscoll Bridge, NJ

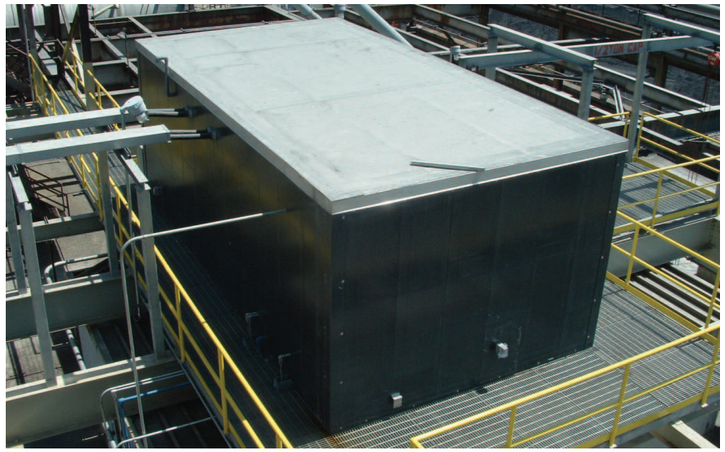


The POWER of DURASHIELD®

Fiberglass Foam Core Building Panels

DURASHIELD® is a tongue-and-groove fiberglass pultruded panel comprised of a pultruded skin over a foam core. The pultruded fiberglass skin is available in either an isophthalic polyester or vinyl ester resin. Both resin systems are flame retardant (UL94 VO). Vinyl ester is utilized in more corrosive applications.

A synthetic surfacing veil is incorporated into the skin to improve weathering, corrosion resistance and protection against degradation from ultraviolet rays. Resistance to weathering can be further enhanced by the application of a polyurethane paint. The core material is rigid closed-cell urethane foam. The foam core provides an insulation "R" factor of 7 for the 1" (25.4mm) panel and 21 for the 3" (76.2mm) panel.



Energy Company's Emissions Monitoring Shelters | New Albany, IN

Fiberglass Shelter | Alaska

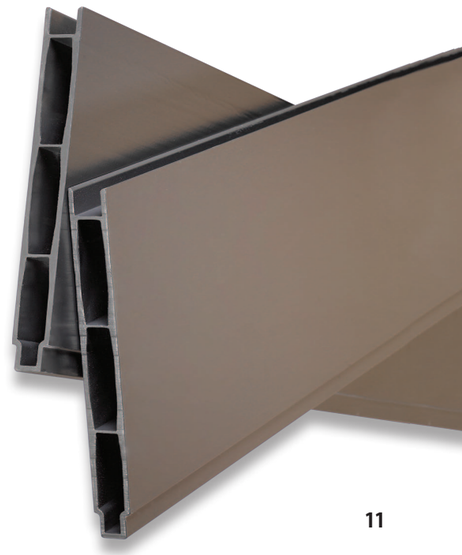
Amador Computer Testing Facility | Rochester, MN

The POWER of DURASHIELD HC®

Fiberglass Hollow Core Building Panels

DURASHIELD HC® is a cost-effective alternative to DURASHIELD® because the building panel has a hollow-core. The panel is a sensible choice for any type of roofing, flooring, enclosures or screening that does not require insulation. It is a custom designed tongue-and-groove building panel for quick assembly and easy installation in various applications.

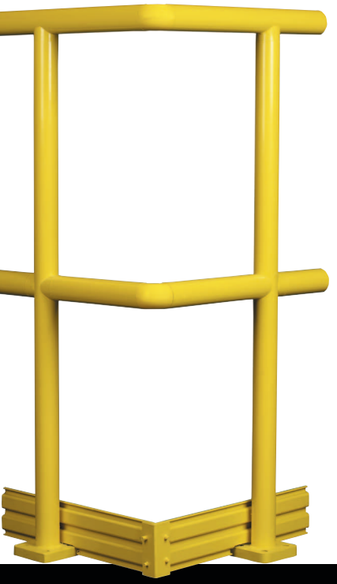
The pultruded panel's unique hollow core and intermediate ribs provide extra stiffness for uses such as decking, cladding or tank covers. The panels can be bonded together with standard adhesives and attached to structural shapes with bolts or screw fasteners. These standard polyester panels will not rot, rust or mildew, which makes them ideal for high moisture environments including saltwater.



The POWER of SAFRAIL™

Fiberglass Industrial Handrail

SAFRAIL™ fiberglass handrails are industrial/commercial railing systems for stair rails, platform/walkway handrails and guardrails. SAFRAIL™ systems are fabricated from pultruded fiberglass components produced by Strongwell and molded thermoplastic connectors. The SAFRAIL™ system consists of internally bonded fiberglass connectors that result in no visible rivets or metal parts.



SAFRAIL™ systems are particularly well-suited to corrosive environments like those found in industrial, chemical and wastewater treatment plants as well as commercial structures with urban and salt air corrosion.

SAFRAIL™ is the result of more than 40 years of experience in the manufacture, design and fabrication of fiberglass handrail systems. The system is available with square, round and channel top handrail and meets OSHA strength requirements with a 2:1 factor of safety.

WWTP Structure | Fajardo, Puerto Rico

Fiberglass Platforms | Ciba Geigy Plant

Access Platforms | Conroe, TX

The POWER of SAFRAIL™

Fiberglass Ladder & Cage System

SAFRAIL™ fiberglass ladders and ladder cages mounted on the sides of tanks and buildings are a common sight in a wide range of industries. Fiberglass ladder and ladder cage systems have been in use since the 1950's in chemical plants and other corrosive environments. Even in complete immersion applications, fiberglass has outlasted aluminum and steel and required little or no maintenance.

SAFRAIL™ ladders and ladder cage systems are produced using a premium grade polyester resin system with flame retardant and ultraviolet (UV) inhibitor additives. A vinyl ester resin system is available upon request for additional corrosion resistance. Standard side rails and cages are pigmented OSHA safety yellow. The rungs are a pultruded fiberglass polyester tube with a fluted, non-skid surface.

Access Ladders

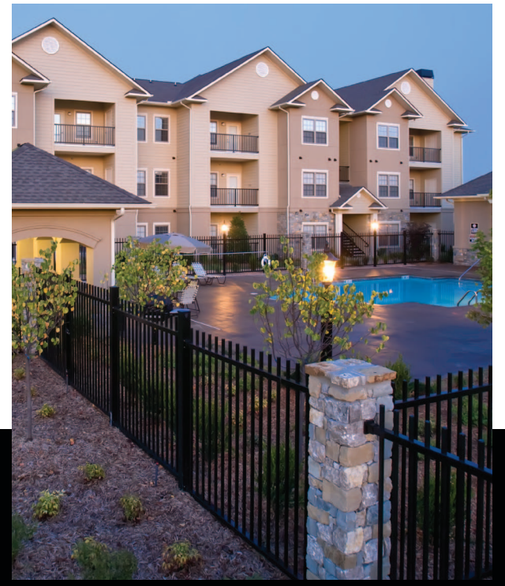
The POWER of STRONGRAIL®

Fiberglass Architectural Handrail & Fencing

STRONGRAIL® architectural handrail and fencing systems are a strong, attractive and safe solution to your structural needs. The standard systems are fabricated from pultruded fiberglass components produced by Strongwell and molded thermoplastic connectors.

The railing systems are particularly well-suited to corrosive environments like those found in commercial structures with urban and salt air corrosion. Systems can be made to meet ADA requirements, adding safety and beauty to your property.

In addition to STRONGRAIL®, Strongwell produces custom fiberglass handrail.



Apartment Complex Fencing & Railing | Tulsa, OK

Hurricane Resistant Home Handrails | Topsail Island, NC

Parking Garage Handrail | Galveston, TX

Caltrain Station Fencing | San Mateo County, CA

Cooling Tower Fandeck

The POWER of SAFDECK®

Fiberglass Overlapping Decking System

SAFDECK® is a system of 24" (609.6mm) wide fiberglass panels that overlap to form a continuous solid surface. SAFDECK® is intended to replace wood, aluminum or steel decking in environments where corrosion or rotting creates costly maintenance problems or unsafe conditions.

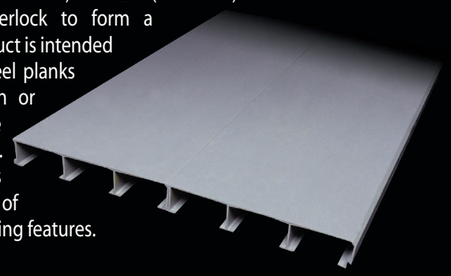
Floating Dock Walkway | Lake Martin, AL

Stay-In-Place Concrete Forms | Black River Falls, WI

The POWER of SAFPLANK®

Fiberglass Interlocking Decking System

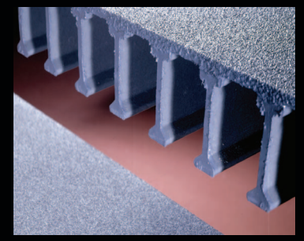
SAFPLANK® is a system of 12" (304.8mm) and 24" (609.6mm) wide fiberglass panels that interlock to form a continuous solid surface. This product is intended to replace wood, aluminum or steel planks in environments where corrosion or rotting creates costly maintenance problems or unsafe conditions. SAFPLANK® provides safe walkways in electrical applications because of its low conductivity and non-sparking features.



The POWER of SAFPLATE®

Fiberglass Gritted Plate

SAFPLATE® fiberglass gritted plate is a tough, corrosion resistant floor plate. SAFPLATE®'s unique combination of pultruded fiberglass plate and an anti-skid grit surface creates textured solid sheet flooring that is ideal for both wet and dry environments. Used in a variety of applications such as trench covers to contain vapors and fumes or pedestrian bridge walkways for sure footing, SAFPLATE® provides a long-lasting maintenance-free alternative to steel plate for severe, corrosive environments.



Train Station Platforms | Manchester, England

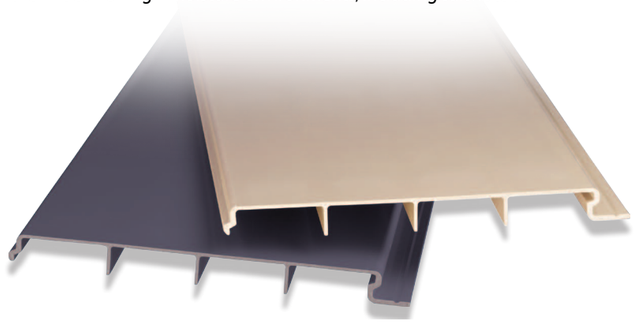
SAFPLATE® is available as solid plate or bonded to DURADEK® or DURAGRID® grating. SAFPLATE® can also be customized to meet the requirements of a variety of applications.

Perdido Beach Resort Decking | Orange Beach, AL

The POWER of STRONGDEK™

Fiberglass Architectural Decking System

STRONGDEK™ fiberglass decking is an attractive, low maintenance architectural decking system that offers an alternative to traditional decking materials that rot and chip. The panels will not rot, rust or mildew, which make them ideal for high-moisture environments, including saltwater.

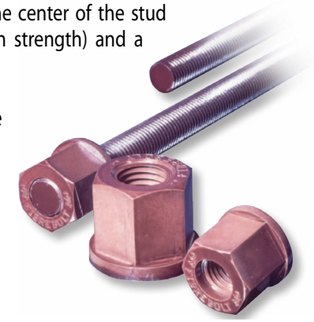


The POWER of FIBREBOLT®

Fiberglass Studs and Nuts

FIBREBOLT® consists of a pultruded stud with threads cut in a glass mat reinforced outer layer (the center of the stud is unidirectionally reinforced for high strength) and a molded nut.

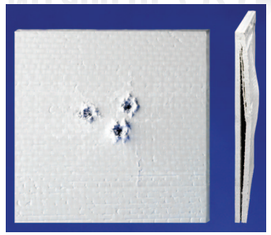
FIBREBOLT® does not possess the thread shear strength of steel, but has sufficient strength to be a viable alternative in structures where fastener corrosion is a concern or where metal fasteners are not permitted (antennae housings, computer equipment testing structures, etc.).



The POWER of

HS ARMOR

NIJ and UL 752 Certified Fiberglass Armor Panels



Strongwell's HS fiberglass armor panels are designed for ballistics resistance. The panels are assembled using specially constructed glass reinforcements in a proprietary resin matrix. The panel components are then cured in a controlled cycle.

When struck by a bullet or other projectile, HS Armor panels delaminate in a way that absorbs the energy and stops the projectile. Thousands of these panels have been purchased by the U.S. Military to help protect our troops in Iraq.

The panels have been independently tested to UL 752 and NIJ (National Institute of Justice) Ballistics Specifications and exceeded all of these requirements.

Common Applications :

- Judge Benches
- Jury Boxes
- Bank Teller Areas
- Panic Rooms and Safe Rooms
- Storm Shelters
- Police Barricades

HS Armor as Drywall | Georgia Public Defender's Building

The POWER of

COMPOSITE ARMOR

Fiberglass Armor for Infrastructure and Military Applications

Strongwell's composite armor is being used by U.S. military troops in Iraq for overhead protection. Strongwell is also involved in developing products for military applications such as vehicular armor and infrastructure shielding. Other commercial applications such as storm shutters are also in development.

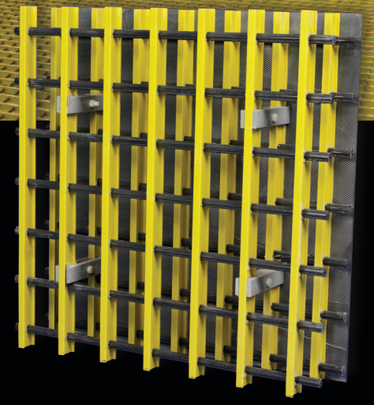
Bridge Deck Repair | Greene County, MO

The POWER of

GRIDFORM™

Stay-In-Place FRP Bridge Deck System

GRIDFORM™ is a prefabricated fiber reinforced polymer (FRP) double-layer grating, concrete-reinforcing system with integral stay-in-place (SIP) form for vehicular bridge decks. The system consists of FRP plates bonded to the bottom grating of FRP double-layer grating panels, creating a bidirectional, lightweight panel for the grid construction of corrosion-free concrete bridge decks. The lightweight GRIDFORM™ panel, which weighs only 4.7 lbs/ft^2 (23kg/m^2), is shop-fabricated in very large units that are limited only by shipping constraints to approximately 8 ft. by 50 ft. (2.4m x 15.2m). The anticipated lifespan of a GRIDFORM™ bridge deck is several times that of steel reinforced concrete bridge decks since FRP provides a corrosion-free reinforcement system for the concrete.

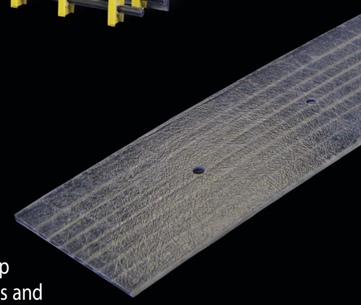


The POWER of

SAFSTRIP®

Fiber Reinforced Strengthening Strip

Bridge Strengthening | Edgerton, WI



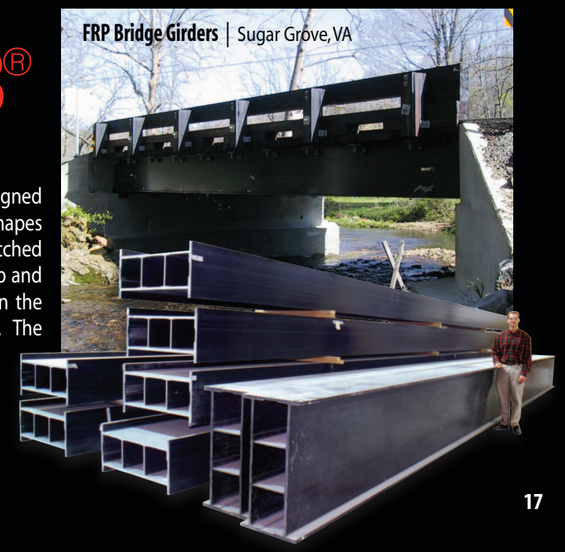
SAFSTRIP® is a pultruded composite strip that improves the strength of an existing structural member when mechanically fastened to the structure. The reinforcing strip has high bearing and longitudinal properties and is designed to strengthen the flexural capacity on the tension face of concrete girders, slabs and decks. Installation on bridges can occur without any interruption of service. Carbon fibers increase the stiffness of the strip while glass mat provides the proper bearing strength. These combined properties allow SAFSTRIP® to be mechanically attached to a structural member.

The POWER of

EXTREN DWB®

Double Web Beam Bridge Girders

The EXTREN DWB® 36" x 18" (914mm x 457mm) double web beams are designed for use in vehicular bridges. These uniquely designed FRP structural shapes incorporating traditional fiberglass rovings, continuous strand mat, stitched fabrics and carbon fiber tows. The carbon fiber tows are located in the top and bottom flanges for increased stiffness. The stitched fabrics are located in the webs and internal stiffeners for improved torsional resistance and shear. The 36" x 18" (914mm x 457mm) EXTREN DWB® has a modulus of elasticity of 6.0 x 10^6 psi (41.3 x 10^3 N/mm^2) versus a modulus of elasticity of 2.6 x 10^6 psi (17.9 x 10^3 N/mm^2) for traditional FRP structural shapes. The double web shape provides excellent stability with torsional rotation less than 1/2% in three point laboratory loading.



FRP Bridge Girders | Sugar Grove, VA

The POWER of COMPOSOLITE®

Secondary Containment Systems

COMPOSOLITE® Secondary Containment System is ideal for use in any application requiring secure containment of liquid or solid materials. The lightweight, high strength pultruded fiberglass Containment System is much easier and more cost effective to install than poured-in-place concrete or earthen containment alternatives. The system also can easily be installed in confined or remote areas or easily removed if necessary.

Each COMPOSOLITE® Secondary Containment System is designed for your specific application. Systems can be assembled by Strongwell or shipped in kit form for field assembly. An optional polyethylene liner (such as Permalon®, manufactured by Reef Industries, or similar) can be added for further protection against leaks in applications involving liquid containment.

Secondary Containment | American Electric Power

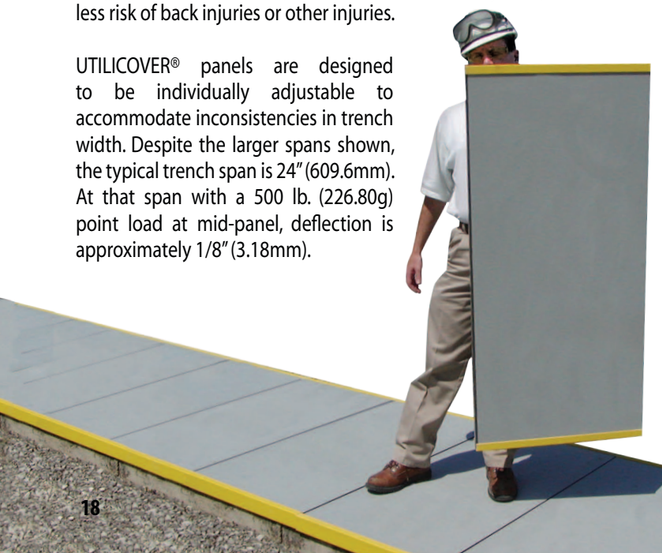
The POWER of UTILICOVER®

Fiberglass Utility Trench Covers

UTILICOVER® fiberglass trench covers are the logical alternative to concrete trench covers for substations. The strong and durable fiberglass cover system installs easily and can be quickly removed for trench access by one person.

The UTILICOVER® fiberglass cover is extremely lightweight, one-fourth the weight of heavy concrete panels, and can be lifted by one person with far less risk of back injuries or other injuries.

UTILICOVER® panels are designed to be individually adjustable to accommodate inconsistencies in trench width. Despite the larger spans shown, the typical trench span is 24" (609.6mm). At that span with a 500 lb. (226.80g) point load at mid-panel, deflection is approximately 1/8" (3.18mm).



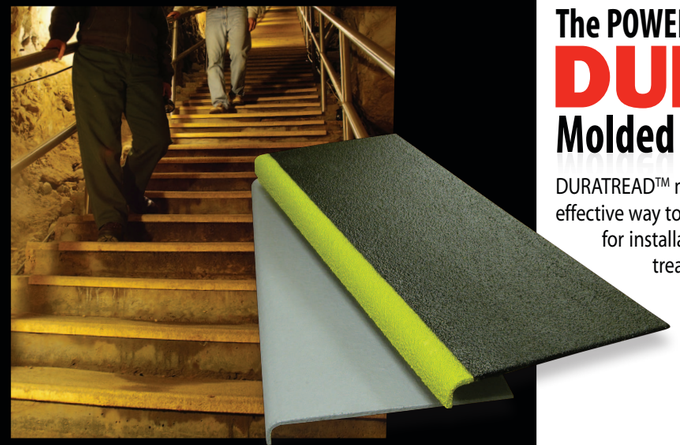
Utility Trench Covers | American Electric Power

The POWER of DURAGRATE®

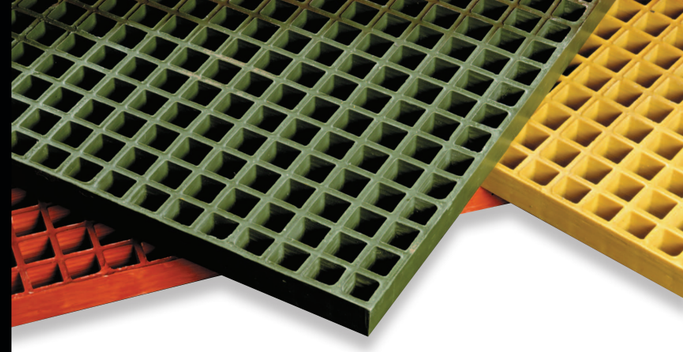
Molded Fiberglass Grating

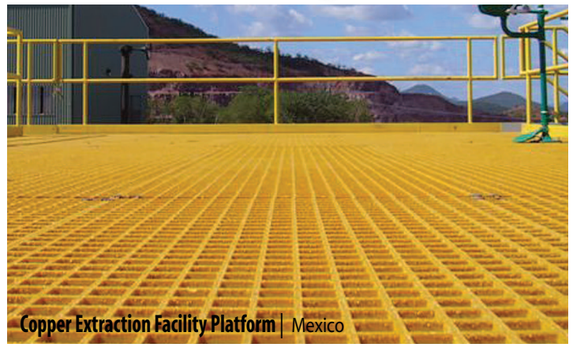
DURAGRATE® molded fiberglass grating is the chemical resistant flooring choice for many industrial applications. The high resin content (65%) provides long maintenance-free performance. The strong mesh grating panel allows efficient on-site cutting to minimize grating waste. Molded grating is significantly lighter in weight than metallic gratings. Standard DURAGRATE® grating has a concave profile on the upper surface for skid resistance. Options such as gritted surfaces and NSF resins are available upon request.

Train Station Screening | Buena Park, CA

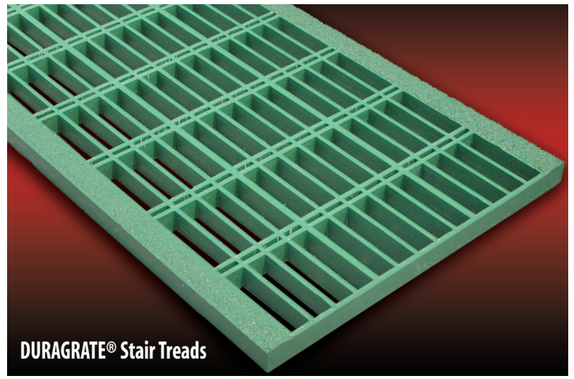


Stair Tread Covers | Mammoth Caves, KY





Copper Extraction Facility Platform | Mexico

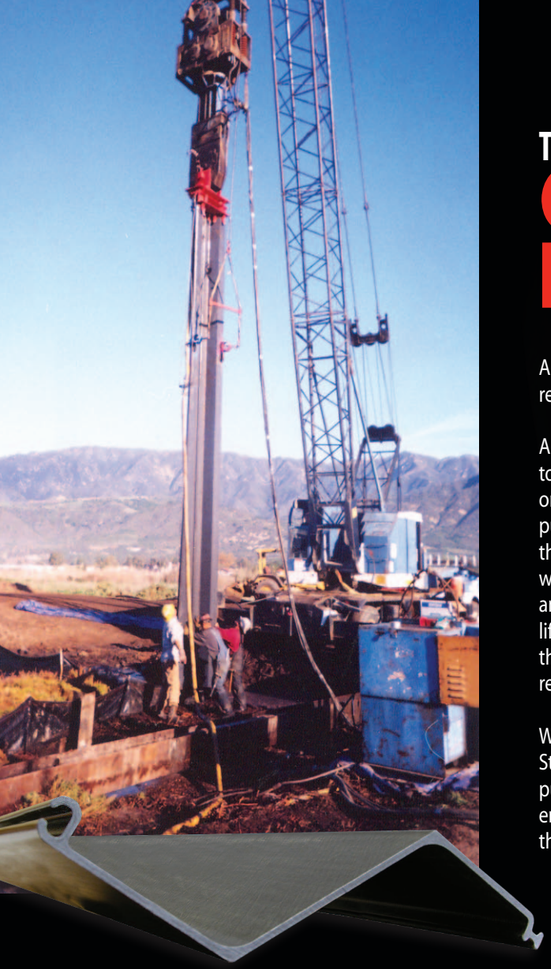


The POWER of DURATREAD™

Molded Fiberglass Stair Tread Covers

DURATREAD™ molded fiberglass stair tread covers provide an easy, cost-effective way to increase the safety of stairways. The covers are intended for installation over concrete, metal or wood steps. Fiberglass stair treads may also be covered with DURATREAD™ .

DURATREAD™ stair tread covers are ideal for use in any area where frequent use or exposure to slippery environments increases the risk of accidents. The ADA compliant covers feature a durable gritted surface and a highly visible nosing to ensure years of safe, maintenance-free service. DURATREAD™ covers can be customized with various colors and stenciled safety messages.



Fiberglass Sheet Pilings

The POWER of
CUSTOM & OEM PULTRUSIONS

A custom pultrusion is a pultruded product customized in shape, resin matrix, reinforcements and composite design.

A custom pultruded part manufactured by Strongwell can be an excellent solution to a wide range of problems in practically any application where standard materials or other fiberglass shapes do not meet the needs of the customer. A custom pultrusion should be considered when a unique shape is needed and/or when the properties of other materials are not suitable for the application. Strongwell works with customers to develop custom pultrusions designed specifically for an application, resulting in better performance, increased reliability and lower life cycle costs associated with the custom pultrusion. Parts consolidation and the competitive advantage that a proprietary design can bring are also attractive reasons to consider a custom pultrusion.

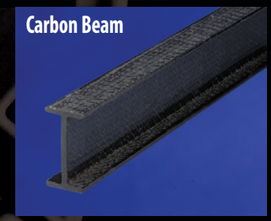
With more than 65 pultrusion machines running up to 40 lines per machine, Strongwell has the unmatched production capacity to manufacture custom pultruded parts. Combined with the broadest range of pultrusion design and engineering expertise, Strongwell offers more custom capabilities than anyone in the industry.

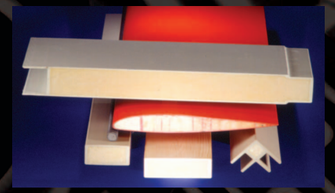
Carbon Fiber Reinforced Drive Shaft

SHAPES - Virtually any shape with a constant cross-section can be pultruded. This allows for the integration of various parts.

RESINS - Standard resins can be modified or special resins can be used to optimize the performance of the pultrusion in challenging environments, such as those found in high temperature or extremely caustic areas. Typical resins include polyesters, vinyl esters, epoxies, phenolics and blends.

REINFORCEMENTS - The type, form, placement and quantity of reinforcements can be customized to maximize economy, develop oriented strength and create or enhance other physical characteristics of a pultruded part. Typical reinforcements used include glass or carbon fibers in multi-filament strands, mat (long fibers held together with a resinous binder) or stitched fabrics.

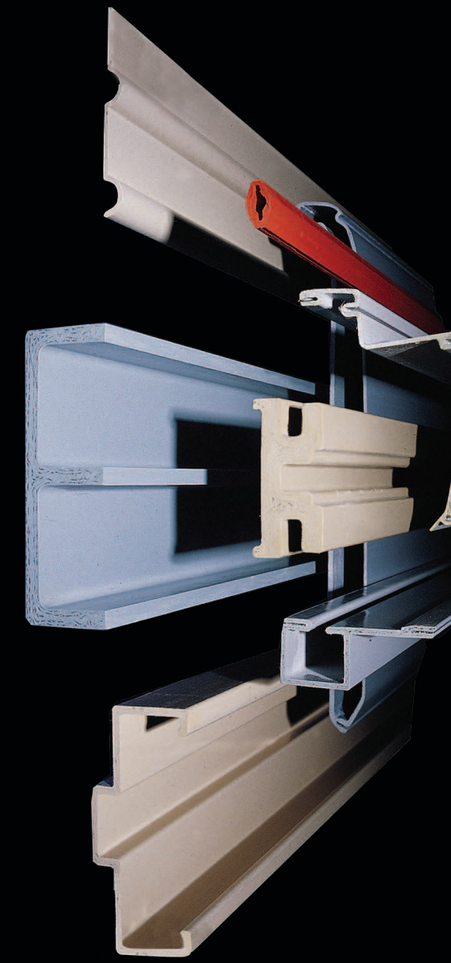




CORE MATERIALS - Strongwell has extensive experience in pultruding over various core materials including foam, balsa, polyethylene and aluminum. In other applications, foam can be added after the part is pultruded.

COMPOSITE DESIGN - A standard shape can be made into a custom pultrusion by customizing the resin or reinforcement to achieve a particular customer need.

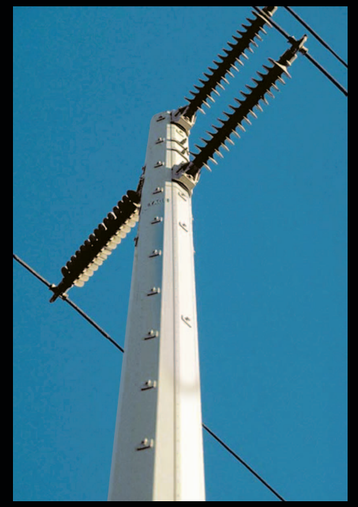
SURFACE VEIL PRINTING - By pre-printing graphics or text on the surfacing veil, Strongwell can easily customize a pultruded part for market identification or specific product needs.



Fiberglass Baffle Panels

Fiberglass Tool Handles

Fiberglass Ladder Rail



Fiberglass Power Poles

Fiberglass Columns

The POWER of

GOING GREEN

As a responsible corporate citizen, Strongwell continually seeks to improve its manufacturing practices to further protect the environment, while providing essential, environmentally friendly products to our customers. All Strongwell divisions employ Environmental Management Systems which have been certified to the ISO 14001 standard, providing audited verification of our dedication to continually improving the environmental impact of FRP composite production. In addition, Strongwell continues to fund third-party, peer-reviewed Life Cycle Analysis (LCA) studies, which invariably demonstrate the inherent environmental advantage of FRP composites compared to other materials such as aluminum and steel.

DID YOU KNOW?

The manufacture of Strongwell's pultruded FRP products:

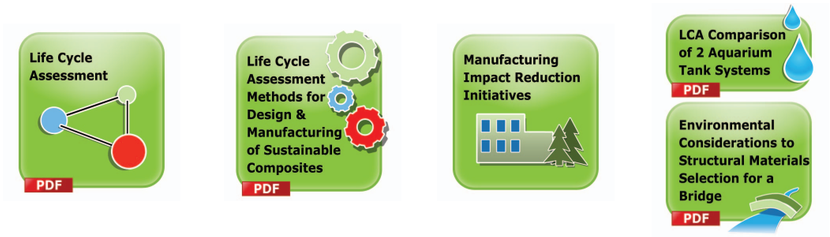
- Produces fewer air and water emissions
- Consumes less energy
- Emits less greenhouse gas

Therefore, FRP composites provide a reduced environmental impact and a lower carbon footprint.

FRP COMPOSITES

- Are highly resistant to rot and corrosion
- Have a longer and more economical service life
- Rarely require energy-intensive maintenance & replacement

These inherent advantages lead to superior overall sustainability for our FRP products. Visit Strongwell's website to see:

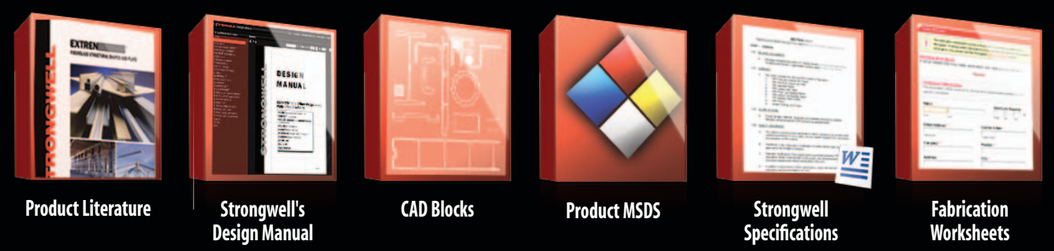


www.strongwell.com/green

Website and Online Tools

www.strongwell.com

You'll Find:



A wealth of information is at your fingertips when you visit **www.strongwell.com**! The site gives you round-the-clock access to all of the above as well as load tables, research initiatives, videos, news, awards, and certifications. The site is continuously updated to provide you with the most current product information.

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