CUSTOM STRUCTURAL FABRICATION

FIBERGLASS STRUCTURES

EXTREN® Structural Shapes & Plate
DURADEK® / DURAGRID® Pultruded Grating
DURAGRATE® Molded Grating
SAFRAIL™ Industrial Railing and Ladder and Cage Systems
FIBREBOLT® Studs & Nuts
COMPOSOLITE® Building Panel System
DURASHIELD® / DURASHIELD HC® Fiberglass Foam & Hollow Core Building Panels
SAFPLANK®, SAFPLANK HD® SAFDECK®, and STRONGDEK™ Decking Systems
INTRODUCTION

Strongwell is both the world's largest producer of pultruded parts and also the largest fabricator of structures utilizing pultruded components. Strongwell operates three ISO 9001 certified pultrusion manufacturing facilities in the U.S.A. with more than 60 machines and 150 pultrusion lines. Two Strongwell locations specialize in fiberglass structural fabrication: Bristol (Virginia) and Chatfield (Minnesota).

Fabrication

Fiberglass materials can be used in place of or in conjunction with aluminum, steel, or stainless steel in fabricated structures. Typical fabrications include beam, column, and plate structures, all-fiberglass buildings, platforms, and other custom fabrications involving grating and handrail. Specialized OEM-type structures such as flue gas desulfurization components, computer testing facilities, and water/wastewater treatment structures can also be accommodated.

Engineering

Strongwell has on its staff registered professional engineers experienced in the design of fiberglass structures and systems for custom design requirements. Strongwell's extensive experience in fabrication procedures, joint design, and stress analysis of the composite assemblies, combined with the use of Strongwell's fiberglass products, result in structures of superior, cost-effective design and structural integrity. Clear, straightforward drawings of structures are provided to the customer for approval before fabrication begins (unless customer drawings are provided).

Benefits

The many inherent benefits of fiberglass can be used to an engineer's advantage in fabricated structures. Today, fiberglass fabricated structures are solving problems in a wide variety of markets and applications. Some of these benefits include:

- Lightweight - weighs 80% less than steel
- Corrosion resistant
- Strong
- Dimensionally stable
- Low thermal and electrical conductivity
- Transparent to EMI/RFI waves
- Easy to fabricate and assemble
- Low in maintenance
MATERIALS OF CONSTRUCTION

Strongwell offers the broadest range of fiberglass structural materials and systems available from a single source. A brief description of some of the products typically used in fiberglass fabrications are given below.

**EXTREN®** Fiberglass Structural Shapes and Plate are produced and stocked in multiple resin series and in more than 100 shapes and sizes for various applications and environments. The standard resin series are:

- **Series 500** - A general purpose resin with excellent corrosion properties.
- **Series 525** - A general purpose resin with excellent corrosion properties and improved fire performance.
- **Series 600** - For harsher corrosive environments and higher temperature applications.
- **Series 625** - For harsher corrosive environments, higher temperature applications, with improved fire performance.

High Strength Fiberglass Grating manufactured by Strongwell includes:

- **DURADEK®** - a standard line of pultruded bar grating made exclusively in the U.S.A. with either “I” or “T” bar shapes that can be designed and used like traditional metal grates or fiberglass molded grating but offers the inherent benefits of pultrusion.
- **DURAGRID®** - custom grating systems offering selections of open space, bar shape, cross-rod placement, resin, color, and types of grit surfacing to accommodate specific applications that cannot effectively be met by a standard fiberglass grating.
- **DURAGRATE®** - a molded fiberglass grating with one-piece grating panel construction preferred for many industrial applications.

**FIBREBOLT®** Fiberglass Studs and Nuts are ideal for applications requiring mechanical fasteners that must be strong, non-corrosive, and/or nonconductive.

**SAFRAIL™** Industrial Fiberglass Railing and Ladder and Cage Systems are particularly well-suited to corrosive environments like those found in industrial, chemical, wastewater treatment plants, and commercial structures with urban and salt air corrosion.

**COMPOSOLITE®** Fiberglass Building Panel System is an advanced composite building panel system for structural applications. Interlocking components make it possible to design fiberglass structures at significantly lower costs for a broad range of construction applications such as bridge decks and enclosure systems, platforms, walkways, tank covers, and cellular enclosures. (*NOTE: COMPOSOLITE® is a registered trademark of Maunsell Structural Plastics, Ltd. and is used by Strongwell Corporation pursuant to license.*)

**DURASHIELD®** Fiberglass Foam Core Building Panel is a tongue-and-groove fiberglass pultruded panel comprised of a pultruded skin over foam core. The panel sizes are: 1” x 12” (R Factor 5) and 3” x 24” (R Factor 17). **DURASHIELD HC®** are hollow core panels that can be used in many of the same applications as **DURASHIELD®** when projects do not require insulation.

Fiberglass Decking Systems are designed to provide a continuous solid surface for applications such as temporary flooring, covers, and decking. **SAFPLANK®** panels interlock and **SAFDECK®** panels overlap. **SAFPLANK HD®** is a heavy duty version of SAFPLANK® intended to support larger loads and cover wider spans. **STRONGDEK™** is architectural decking with hidden fasteners. The systems are intended to replace wood, aluminum, or steel in corrosive environments.
Above: Stairway/walkway structures using EXTREN® structural shapes, DURAGRID® pultruded grating, and SAFRAIL™ handrail solve corrosion problems in chemical processing environments.

Left: After more than 20 years, the system of FRP spiral stairs and landings continue to be structurally sound at the Cordova Park Observation Tower near Des Moines, Iowa.

Below: Expansion of the Fajardo Waste Water Treatment Plant in Puerto Rico included designing fiberglass platforms and walkways over the facility’s piping.
FRP was chosen for this three-story fire escape because fiberglass would not require painting or maintenance.

This corrosion-resistant fiberglass walk-over bridge platform allows the Oceanic Marine Institute in Hawaii to monitor large batches of shrimp under research.

A raised floor in the processing room of a California film development laboratory surrounds existing equipment, provides access above and below the floor, withstands the corrosive environment, and provides a 200 lbs./sq.ft. load capacity to support heavy machinery.

DURAGRID® Phenolic grating was used on an offshore platform for fire integrity, weight savings, and low maintenance. DURAGRID® Phenolic grating is U.S. Coast Guard approved.

A pair of platforms constructed using Strongwell’s FRP products is used by the U.S. Army to help test the radar systems of its helicopters, troop transports, and tanks.

This corrosion-resistant fiberglass walk-over bridge platform allows the Oceanic Marine Institute in Hawaii to monitor large batches of shrimp under research.
INDUSTRIAL RAILING AND LADDER AND CAGE SYSTEMS

Fiberglass railing and ladder and cage systems have existed since the 1950s and are used in a wide variety of severe environments such as those found in chemical, water/wastewater, pulp and paper, mining, plating, oil and gas, marine, and general industries.

Both standard and custom railing systems are manufactured by Strongwell. SAFRAIL™ fiberglass railing is a standard system that is available for customer fabrication on site or it can be prefabricated by Strongwell. Custom railing can also be designed and fabricated to suit specific customer needs.

Strongwell ladders meet the requirements of OSHA 1910.23 and 1926.1053. Ladders and cages manufactured from Strongwell are used in wet well applications, on the sides of chemical storage tanks, and in access and service areas throughout the world.

A round SAFRAIL™ handrail system and DURAGRATE® molded grating provides a safe, corrosion resistant walkway, and work platform for an extremely corrosive environment at this copper extraction facility in Mexico.

These tanks are surrounded by SAFRAIL™ and DURAGRID® walkways and covered with COMPOSOLITE® covers for odor control.

Fiberglass access ladders and walkways used throughout the service areas of Sea World in Orlando, Florida, resist saltwater corrosion and reduce maintenance costs.

Stairway/walkway structures using EXTREN® structural shapes, DURAGRID® pultruded grating and SAFRAIL™ handrail solve corrosion problems in chemical processing environments.
Corrosion of metal structures in water/wastewater treatment plants is severe and requires constant maintenance, downtime and replacement. Low maintenance fiberglass structures are ideal for this environment because they are lightweight, corrosion resistant, and easy to install.

Lightweight, corrosion resistant 24" fiberglass I-beams span 45' to bridge clarifiers at a wastewater treatment plant in Las Rusias, Texas.

A baffle system using Strongwell’s baffle panels and EXTREN® structural shapes was fabricated for this chlorine contact chamber. FRP was chosen for its low cost and high corrosion resistance. Even after more than 5 years, the FRP panel system is still exceeding expectations (see inset).

Low maintenance fiberglass grating, ladders, and handrail replaced steel to provide trouble-free operations for a wastewater treatment clarifier in Albert Lea, Minnesota.

FRP odor control covers around the perimeter of wastewater treatment tanks in Grand Prairie, Texas, were fabricated using COMPOSOLITE® and DURASHIELD® structural panels, EXTREN®, and several custom shapes.
All-fiberglass buildings are transparent to electromagnetic waves, have high dielectric strength, are structurally strong and have effective insulation properties. Shielding can also be accomplished utilizing different manufacturing techniques.

EXTREN® fiberglass plate and structural shapes were used for cellular antenna enclosures. The enclosures were designed to match the style and appearance of the Santa Ana Historical building.

This all-fiberglass facility for Amador Corp. assures RFI/EMI compliance in testing computers as well as other manufactured equipment.

This test facility for Hewlett-Packard Corporation was constructed using EXTREN®, DURASHIELD®, and FIBREBOLT®.

DURASHIELD® foam core building panels and EXTREN® Series 525 fiberglass shapes were used to fabricate this fiberglass building in Alaska. DURASHIELD® was selected for this project for its durability, light weight, and thermal properties.
ARCHITECTURAL STRUCTURES AND APPLICATIONS

The features of Strongwell’s fiberglass products can equally become significant benefits in many architectural applications.

A 37’ tall, all-fiberglass, gold leaf clad spire, installed in 1991 atop the 55-story C&S Building, is the golden high point on the Atlanta skyline. The fiberglass spire is transparent to electromagnetic waves and houses communications antennae. The fiberglass spire aesthetically enhances one of Atlanta’s tallest buildings - making it the city’s landmark skyscraper. In addition, the spire is extremely valuable real estate. Prime antennae rental space is scarce and expensive.

A fiberglass waterpark platform in Cypress, Texas, was fabricated using EXTREN® structural shapes, DURAGRID® pultruded grating, and STRONGRAIL™ fiberglass architectural handrail.

A custom fiberglass architectural handrail system is the ideal solution for corrosive coastal environments like this theme park pier in Galveston, Texas.

DURAGRID® pultruded fiberglass grating was installed as visually appealing louvers, concealing the air conditioning units of a school in Hong Kong.

A Carrollton, Georgia, restaurant reduced maintenance costs by installing durable fiberglass gates to screen waste disposal areas.
Corrosion resistant, easy to fabricate, and lower life-cycle cost, fiberglass can be a cost effective, reliable problem solver in structure refurbishment and new build projects. Fiberglass is ideal for a broad range of construction applications. Increased service life and reduced maintenance costs are inherent advantages of using fiberglass systems.

The Craig Brook National Fish Hatchery in East Orland, Maine, used corrosive-resistant EXTREN® structural shapes to frame roofing structures over moisture rich crowding pools.

A 62’ tall weather tower at Vandenberg Air Force Base near Santa Barbara, California, is composed of EXTREN® structural shapes, ladders, and DURAGRID® pultruded grating.

The Craig Brook National Fish Hatchery in East Orland, Maine, used corrosive-resistant EXTREN® structural shapes to frame roofing structures over moisture rich crowding pools.

Above, Right: An Ohio based exhibit company constructed this trade show booth using EXTREN® structural shapes.
EQUIPMENT/FACILITIES, FIBERGLASS ROOFS, AND COVERS

To meet EPA and OSHA standards in severely corrosive environments such as pulp and paper plants, chemical plants, and oil refineries, DURASHIELD®, COMPOSOLITE®, and EXTREN® have been fabricated into enclosures to contain corrosive and toxic fumes and solutions. In many cases, all-fiberglass containment has been the only solution to critical pollution problems that all other materials have failed to resolve.

Above, Right: COMPOSOLITE® panels are ideal for use as odor control covers. The strong yet lightweight covers are easy to handle and can withstand the harsh environment for years. The panels also require little to no maintenance.

An odor control cover was constructed using EXTREN® structural shapes for a waste water treatment facility in Puerto Rico. The second photo also shows the COMPOSOLITE® cover installed.

A pulp plant in Canada replaced 70’ x 120’ corroded wooden covers over anaerobic digesters with fiberglass covers to satisfy government regulations. EXTREN® and DURASHIELD® were used to fabricate the covers. Design prefabrication and supervision of installation was completed by Strongwell.

A COMPOSOLITE® fiberglass building panel system functions as a clarifier cover in East Helena, Montana. The composite building panels were selected to prevent freezing during the winter and reduce algae growth in the summer months.
A tank stand was fabricated with EXTREN® structural shapes, SAFRAIL™ handrail system, and DURAGRID® pultruded fiberglass grating for an industrial plant.

Strongwell’s pultruded grating replaced rusted grating in a catwalk system for a California winery.

The Avila Beach Pier in California was reconstructed using EXTREN® structural shapes for support, DURAGRID® pultruded grating, stair treads, and custom handrail.

A fiberglass fabricated roof tops the Aerial Tram Station on Stone Mountain, Georgia (as seen on the cover). Concealing over 20 antenna, the fiberglass structure comprised of EXTREN® and DURASHIELD®, meets structural requirements while not interfering with the radio frequencies.