PROFILE
STRONGWELL NEWS & APPLICATIONS • SPRING 2018

Case Study: Custom Pultrusion

First in Flight with Personal Hydrofoiling

Born out of a concept by the head engineer at Lift Foils, the Lift eFoil was made possible through the innovative use of composites combined with emerging technologies. The Lift eFoil is the first electric hydrofoil surfboard with wings underneath to create lift as it gains propulsion through water.

During the prototyping stage, common metallic and off-the-shelf components were used.

Eventually, Lift Foils co-developed a custom pultrusion with Strongwell to produce the strong, lightweight backbone of the revolutionary Lift eFoil.

The keel was originally prototyped with metal, then resin transfer molding (RTM). Pultrusion offered an opportunity to ensure tolerance consistency and proper fit of additional components for mass production. With the introduction of numerous types of carbon and glass reinforcements, stitched, and woven materials, the mass manufacturing process of Strongwell's pultrusion yields a carbon and glass keel to produce the greatest multi-axis strength with the lightest possible weight.

This particular pultruded CFRP hybrid keel provides strength and stability for riders without sacrificing levitation performance. Topping out at 25 mph (or 22 knots), the keel on the eFoil works with a winged fin and electric motor to provide the sensation of flight over water for riders up to about 200 lbs.

Since launch, the eFoil has gained in popularity for professional and novice surfers alike. The product has been on tour globally and featured on various digital news outlets.

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Case Study: DURAGRID® & EXTREN®

Fiberglass Runs Through Elevated Rail Walkway

The New Farm Lane Underpass project was instituted due to an increase of residential and commercial growth around a major public university in East Lansing, Michigan. On a daily basis, close to 60 trains travel through that particular campus. In some instances, these trains span as long as two miles, causing up to five hours of accumulated daily traffic delays. To remedy these delays, an underpass, accompanied with bike paths and sidewalks under the railroad bridge, was created to continue the flow of traffic.

The elevated railroad bridge supporting the railroad lines had to be refurbished as well. One of the requirements was to create a service walkway on the elevated railroad bridge which would be low-maintenance and electrically nonconductive. Due to the harsh winters in Michigan, the walkways also had to provide slip resistance and corrosion resistance against a myriad of deicing salts and liquids. As the size of the university's campus is estimated to be around 5,200 acres, the distant storage of the building materials from the build site posed some logistical site transportation challenges. Therefore, an easy-to-transport and lightweight material was prescribed to limit traffic interruption.

Understanding all these challenging factors, Alro Plastics supplied Strongwell's 1-½" thick DURAGRID® I-6000 gritted pultruded grating with EXTREN® 500 series 3" x 3/16" equal leg angle to create a system for the walking surface. The Made in USA grating is exclusively manufactured in Strongwell's Chatfield facility and EXTREN® is made exclusively in the USA at one of Strongwell's three domestic facilities.

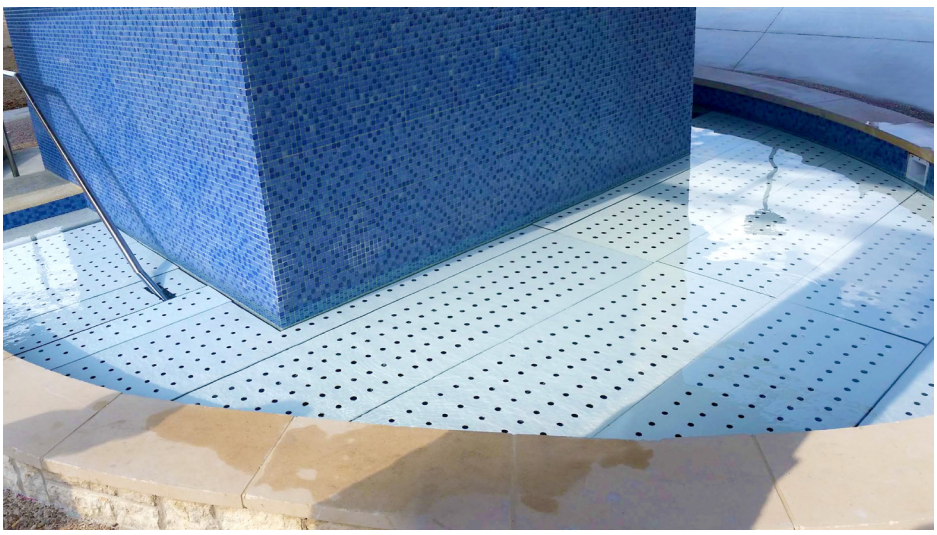
After more than five years in service, both the user and supplier have reported that the DURAGRID® and EXTREN® products have fared well in performance, safety, durability and aesthetics. ●

Case Study: COMPOSOLITE®, EXTREN®, & FIBREBOLT®

A Composite Safety Deck for a Baptistry

Since the early days of the Christian Church, the Baptistry has been an important architectural and ceremonial part of most church buildings. In denominations which practice baptism by immersion, a baptismal pool is generally used. Modern baptistries are outfitted with pumps, heaters, drains, timers, seats, plumbing, handrail, windows, and steps - a true architectural water feature.

In 2015, the Second Baptist Church in Katy, Texas, wished to outfit their baptistry pool with a removable safety deck. Initial designs utilizing steel presented rust and weight challenges. An alternative application suggested wood which created water absorption and rotting concerns. The Second Baptist Church contacted a local fabricator, which was able to design and fabricate a custom safety deck utilizing Strongwell's COMPOSOLITE® building panels and EXTREN® structural shapes. Custom fabricated parts were assembled on-site to protect and house the supporting equipment underneath the structure, which spanned as wide as 18' in some areas.



In addition to the need for corrosion resistance, the safety deck had to be easily submersible, yet lightweight enough to be handled without the need for special equipment. The simple (yet very effective) solution was to rout several holes in the deck for ease of water flow.

Both the installer and Second Baptist were very pleased with this unique application of pultruded fiberglass composites. ●

Case Study: DURAGRID® & EXTREN®
How Do Things Work?

As a traveling exhibit, *Things Come Apart* is a visual investigation of design and engineering. Supported by the Smithsonian Institution Traveling Exhibition Service (SITES), the exhibit embraces STEAM (Science, Technology, Engineering, Art, and Math) concepts. Todd McLellan, a photographer/artist wanted to provide an environment for individuals to explore and dissect some of the most common, useful, and prized possessions such as a Walkman, iPod, sewing machine, mechanical pencil, and the telescope.

The Birthplace of Country Music (BCM) Museum's Special Exhibits Gallery was recently asked to host *How Do Things Work?* Typically, this traveling exhibit suggests that facilities dedicate around 2,000 square feet of space for the exhibit, as contents include almost forty photographs, four disassembled objects, one to two video players with monitors, and three hands-on education activity kits. To create a more open space, BCM museum facilitators needed to maximize the open space for interaction and facilitation. A suggestion was made to utilize the window areas to create a floating gallery trellis. However, the supportive materials were sensitive to UV exposure and had to be attached to an existing window support structure without the use of extensive retrofits.

The museum asked Strongwell to design and provide a lightweight floating window gallery trellis using FRP. Additionally, the customer requested the finished product be painted in a custom Pantone to match the exhibit. The end result of this request was four DURAGRID® I-9000 panels, pultruded with 12-inch cross-rod spacing, from Strongwell's Chatfield facility. Strongwell's Bristol facility designed and fabricated supporting brackets and provided 1.5" EXTREN® channel mounted to the window ledge as tracks for each vertical window trellis panel.

The customer was extremely pleased with the custom application and attention to detail. They were also pleased with the portability of the panels, as each can be removed and stored to support future gallery exhibits. ●

Spotlight on Strongwell Talent

Chelsea Leonard
Executive Assistant - Bristol

Chelsea Leonard has accepted the position of Executive Assistant. In her new role, Chelsea will report to the President and Chief Executive Officer. Chelsea comes to Strongwell with 10 years of customer service and administrative experience in various fields including; sales, sports and entertainment, education, and most recently, government. She previously worked with the City of Bristol, Virginia where she held the position of Office Manager for the Public Works Department, and Customer Service Representative for Bristol Motor Speedway. She graduated from Northeast State Technical Community College with an Associate's Degree in Office Administration Technology, and holds a technical certificate in Office Administration.

Carrie Bowers
Process Engineering Manager - VA Operations

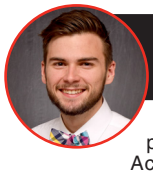
Carrie Bowers has accepted the position of Virginia Operations Process Engineering Manager. Carrie has worked for Strongwell since 2012 as Virginia Operations Quality Assurance Manager. She came to Strongwell with many years of experience as quality engineer and production manager in the automotive industry. She holds a Bachelor's Degree in Electrical Engineering from Virginia Tech.

Josh McCroskey
Custom Products Manager - VA Operations

Josh McCroskey has accepted the position of Custom Products Manager for Virginia Operations. Josh began his career with Strongwell in 2006 as a Process Engineer. He holds a Mechanical Engineering degree from Virginia Commonwealth University. He most recently was the Process Engineering Manager in Bristol.

Jennifer Koetz
Administrative Assistant - Chatfield

Jennifer Koetz has accepted the position of Administrative Assistant. In her new role, Jennifer will report to the Vice President of Minnesota and Mexico Operations. Jennifer was previously Administrative Assistant to the Manager of Manufacturing and Engineering.



Justin Suggs
Accounts Payable Administrator - VA Operations

Justin Suggs has accepted the position of Virginia Operations Accounts Payable Administrator. In his new role, Justin will report to the Chief Financial Officer. Justin graduated from East Tennessee State University in 2017 with a double major in Accounting and Finance.

Literature Updates:

- *SAFRAIL™ Industrial Handrail Brochure*
- *SAFRAIL™ Ladder & Cage Brochure*
- *COMPOSOLITE® Secondary Containment System Installation Guidelines*
- *Fiberglass Structures Brochure*
- *Availability List (I&M)*
- *Design Manual (I&M) Sections:*
  - *12, 13*

Visit www.strongwell.com for the latest resources.

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What's in this Issue:

Do your ladders, guards, and handrails meet the latest OSHA standards?

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Are Cost Effective - Corrosion resistant, pigmented fiberglass will outlast aluminum or steel systems with virtually no maintenance. The systems' easy-to-assemble designs provide savings on installation time and labor. The light weight of the systems saves on freight costs and minimizes the need for special installation equipment.

Assemble Easily - lightweight standard sections can be prefabricated in large sections and shipped to the jobsite or fabricated and installed on site with simple carpenter tools.

Have an Internal Connection System - construction of continuous handrail systems is simplified, even around circular tanks, without special fittings.

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