

# VISION



## New Ways of Road Transportation



**04** FRP panels Used the Construction of Brazilian Homes



**05** FRP Canopies Protect Steel Pipe in Hoover Dam's Penstock Tunnels



**07** Zhonghao Technology Competitive Advantage for Corrosion Resistance Applications

# EDITORIAL

## NEW WAYS OF ROAD TRANSPORTATION



"If you took all the composite parts off a (sport) car today, it probably wouldn't stay on the track" said Rusty Wallace, a former NASCAR driver at COMPOSITES 2012.

One of the most significant global challenges we face is balancing the need for automobiles and personal transportation with the stress that present technology places on energy consumption and global warming. The global car production output is expected to increase 6%<sup>3</sup> with Brazil, Russia, India, and China accounting for 30% of world auto sales in the 2014<sup>9</sup>. Obviously creative solutions are needed to reduce this market consumption of nearly one-third of all global energy<sup>7</sup>.

The need for lighter-weight vehicles for energy reduction and sustainability is compelling. For every 100 pounds of weight a vehicle carries, there is a 2% reduction of gas mileage performance<sup>10</sup>. While more than two-thirds of a car's weight is steel, kilo of composites in a car vary from 3 (China) to 12 (Europe)<sup>14</sup>. With a typical composite part weighing 25% to 35% less than conventional materials<sup>13</sup>, composites can be a major contribution to more efficient, sustainable vehicles.

Owens Corning was there when the first composite auto body was introduced in 1953 and remains a leader in developing solutions to support less energy intensive trends in the global automotive market. Since the 1970's, we have seen a dramatic rise in the use of thermoplastic materials in vehicles. This has enabled the replacement of metal for weight reduction, through design flexibility and function integration. By partnering with our customers who represent some of the leading automobile suppliers and manufacturers, we play a key role in developing reinforcement technologies for a broad range of thermoplastic resins from PP to PEEK. Today, Owens Corning offers the widest selection of products to meet the market need for each resin type.

More recently we have seen the development of solutions using longer reinforcement structures (eg. LFT using PP resins). In the future, we expect this trend to develop with the move towards continuous fiber solutions marrying both reinforcement technologies with fabrication technologies. Complex reinforcement structures will enable even greater penetration of thermoplastics into automotive applications.

Owens Corning is committed to supporting its customers' technological demands throughout the world. Our new Shanghai China Composite Center is our most recent example of adding to the power of our application support by having dedicated resources and capabilities in one of the fastest growing markets for automotive manufacturing.

The composites industry can be a leader in developing next generation solutions that enable the continued adoption of lighter, more efficient and cleaner vehicles. This trend will benefit the transportation of societies and our planet.

Let's work together and reach this goal.

Sincerely,

Arnaud Genis  
Group President  
Owens Corning Composite Solutions Business

### FIGURES ARE TELLING

- Only about **14%-26% of the energy** from the fuel you put in your tank gets used to move your car down the road<sup>1</sup>.
- **16%** of global man-made **CO2 emissions** results from road transport<sup>15</sup>.
- In the USA, \$4 per gallon gas prices could result in an additional **670 million** public transit passenger trips<sup>2</sup>.
- China aims to reduce fuel consumption to **4.5 liters per 100 kilometers** by 2020<sup>3</sup>.
- There were **14.8 million natural gas vehicles** by 2011<sup>11</sup>, i.e. less than 1% of the world's road fuel consumption<sup>12</sup>.
- A Stanford University research team has a long-term goal to develop an **all-electric highway** that wirelessly charges cars and trucks as they cruise down the road<sup>4</sup>.
- 70% of cars sold in Europe in 2015 will use the new **Start-Stop technology** that improves fuel economy<sup>5</sup>.
- Engineers at Mahindra & Mahindra are taking on a nearly impossible challenge: to build a new sports utility vehicle that weighs **less than one ton** instead of the 1,600-2,000 kg currently<sup>6</sup>.

1 - <http://www.fueleconomy.gov/feg/atv.shtml>

2 - <http://transportation.nationaljournal.com/2011/03/theimpact-of-high-gas-prices.php>

3 - PLASTICS NEWS CHINA

4 - ScienceDaily (Feb. 1, 2012)

5 - <http://www.johnsoncontrols.com/publish/us/news> and <http://www.jsonline.com>, May 2012

6 - The Economic Times, Oct. 2011

7 - Lux Research (Boston, MA), 2012, Structural Navigation: Optimizing Materials Selection in Automotive and Aerospace.

8 - CSM Auto Global Insights, February 2012

9 - Winning the BRIC Auto Markets BCG.pdf\_The Boston Consulting Group, Inc., 2010

10 - <http://www.ecofriend.com/entry/5-efficient-plug-hybrid-vehicles-helping-save-fuel/>

11 - Worldwide NGV Statistics, NGV Journal, Retrieved 2012-04-24.

12 - The Contribution of NGV to Sustainable Transport.pdf - Intl Energy Agency Michiel Nijboer - 2010

13 - Scientific American Magazine and Ward's Automotive Yearbook

14 - CSM Auto Global Insights, February 2012

15 - International Organization for Motor Vehicle Manufacturers OICA - 2008

# Poles Offer Sustainable Light Solution for All in Brazil

Brazil's Light for All Program was launched in 2003 and has provided electricity to approximately 12 million people or almost 3 million homes. Despite success, expanding the program to include those who live in forested or mountainous areas with little to no access to roads presents new challenges.

Necessity, however, often brings technological innovation. Combine the need for electricity with Owens Corning's innovation promoting the use of fiberglass reinforced polyester materials in light poles, and a sustainable solution is achieved. The fiberglass reinforced materials are produced at Owens Corning's facility in Rio Claro-SP, Brazil, with the poles being manufactured in Manaus.

Eduardo Giardi, Operations Director of Brazilian power distributor AES Sul, stated to the Brazilian press the company is constantly searching for new technologies and supports the widespread use of the fiberglass poles. "Since the fiberglass poles are more flexible than concrete and metallic structures, they weather storms better and, because the fiberglass poles do not corrode, significantly less maintenance is required compared to other structures" Said Giardi.

Since the poles do not conduct electricity, they are safer to install, and using fiberglass reinforced materials can reduce construction time and total costs.

According to technical experts within Owens Corning, another advantage of the fiberglass poles is that each weighs just over 100 kilograms; conventional poles can weigh ten times this much.

*“Because the fiberglass poles are considerably lighter, they are more easily transported to isolated locations by helicopters, canoes, pack animals, and even people.”*



These poles are also a solution for heavily populated areas and inner cities where access by large equipment is limited.

The Light for All Program has captured the attention of many countries including Latin America, Africa and Asia, and discussions are underway to create similar programs in these and other countries. The program has been so well received, the United Nations is using it as a case study on how electricity can be provided to brighten the lives of millions more people around the world.

**For more information, please contact Owens Corning Customer Service in Brazil at 0800 707 3312**

# FRP panels Used in the Construction of Brazilian Homes

Courtesy MVC Soluções em Plásticos, Brazil



**When the Brazilian Federal Government launched the Minha Casa, Minha Vida (My House, My Life) program in March 2009, a number of companies were selected to build homes for low income families.**

One such company was MVC, a leader in developing products and solutions for engineering plastics. And, MVC's innovation was to use fiberglass-reinforced polymer (FRP) in wall panels being installed in the homes.

MVC in partnership with M. Rocha, a Brazilian construction company, is supplying 436 houses that are being built in the municipality of Japeri in Rio de Janeiro. MVC was chosen to participate in this project because of its innovative and sustainable high quality building solutions that offer advantages over conventional processes according to the company. Their solutions for these homes use an innovative "wall system" that comprises a metallic structure and wafer-like panels made of FRP sheets similar to those used in airplanes and boats. The sheets are used along with expanded polystyrene and a hard gypsum core.

"The composite system also offers thermal and acoustical comfort, and no waste over traditional systems of masonry construction using bricks and mortar." The wall panels are provided to the site painted and with electrical and hydro-sanitary systems already built into the walls, which reduces costs and construction time.

Construction of the houses began in May 2012 and will be completed in December of this year. The first houses were available for occupancy in May. The units are approximately 37.8m<sup>2</sup> and include a kitchen, living room, bathroom, two bedrooms, laundry, and service area. Gilmar Lima, General Director of MVC, stresses that the housing project in Japeri is an example of housing worthy of use throughout the whole country.

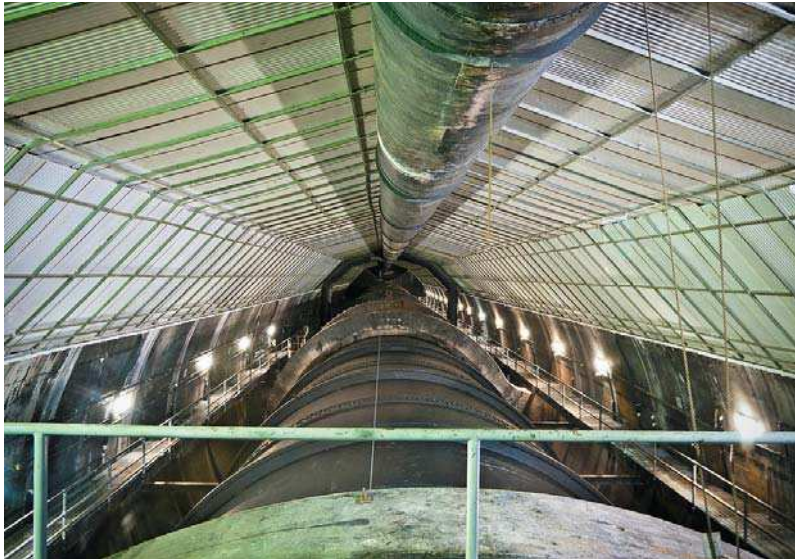
"We are very proud to be part of this project that brings high quality homes to the people, using advanced construction standards even in remote areas of Brazil", said Ricardo Grizzo, Owens Corning's VP for Latin America.

**“According to MVC, its composite system has the advantages of reduced construction time, higher strength materials offering longer durability.”**

**For more information please visit [www.mvcplasticos.com.br/noticias.php](http://www.mvcplasticos.com.br/noticias.php)**

# FRP Canopies Protect Steel Pipe in Hoover Dam's Penstock Tunnels

A modern marvel of engineering, the Hoover Dam has straddled the border between Nevada and Arizona since its completion in 1935.



Courtesy Bedford Reinforced Plastics, USA

Standing an incredible 221 meters high and measuring more than 20 meters thick, it continues its mission of harnessing the power of the Colorado River. Three years before the dam was completed, penstocks or steel pipe, 30-feet in diameter, began carrying water from each of the four intake towers in the reservoir to the power plant and canyon wall outlets. When the penstocks began exhibiting signs of corrosion after almost 70 years in service, the solution was fiberglass-reinforced polymer (FRP) canopies containing Owens Corning's Advantex® glass.

The penstock tunnels play a vital role in the dam's function. In the late 1990's, routine maintenance revealed that condensation from the tunnel walls surrounding the steel pipe was causing it to corrode.

Replacing the pipe, however, was not an option because of the size and amount of pipe involved. Bedford Reinforced Plastics, a manufacturer of high-performance structural fiberglass products located in Pennsylvania provided the solution in early 2001. Bedford developed canopies made of FRP using Advantex® glass that were installed over the pipe during the following year.

According to Eric Kidd, Director of Marketing with Bedford, the company's solution involved more than 10,000 pounds or 15,000 feet of FRP materials, including square bars and I-beams that provided a supporting framework for FRP corrugated panels fitted over the steel pipes.

**“Our FRP, which is 75% lighter than steel, corrosion resistant, and easily installed with low maintenance, became the solution to protecting the steel pipe in a corrosive environment,” said Kidd.**”

As stated previously, Bedford's FRP composite material used in the canopies includes Owens Corning's Advantex® glass. According to Matt Lieser, Global Specification Leader with Owens Corning, Advantex® glass fiber reinforcements are a corrosion-resistant, boron-free E-CR glass with sustainable benefits that performs exceptionally well in corrosive environments.” Bedford's canopies have been in place for more than a decade and continue to shield the penstocks from further damage preserving the integrity of the dam's historical mission and amazing its 1,000,000 visitors every year.

**To learn more about Bedford, visit [www.bedfordreinforced.com](http://www.bedfordreinforced.com)**



# Helping Our Customers Grow A Success Story Using Innovative Marketing

A webinar, a Web-based seminar or presentation, is an increasingly popular communications tool that allows time- and cost-sensitive training and education opportunities.

According to Forrester Research, Inc., data shows that firms using webinars have a revenue growth rate of 10% or higher over their direct competitors. In the last three quarters, Owens Corning has participated in three webinars with the intention of helping customers grow. The latest was a joint event hosted by IDI Composites International on April 26, 2012. Approximately 240 registrants from around the world interested in learning about composites participated.

IDI Composites International is a formulator of traditional and structural thermoset composites. The webinar demonstrated that the company's structural thermoset compounds offer advanced properties in strength, weight, durability, and design freedom thanks to appropriate selection of reinforcement and resin materials and for a wide spectrum of applications. According to Paul Rhodes, Vice President of Marketing, the advantage of participating in the webinar is that it gave IDI the opportunity to describe the benefits of its products, allowing customers to match the right materials with the intended application.

*“Owens Corning helps us grow our business through marketing efforts, such as the webinar, and in providing superior products and a trusted brand, said Rhodes.”*

Webinars have provided Owens Corning with the platform to step up as an industry leader, and participants are recognizing its expertise. “With the rising cost of metals, customers are looking for alternatives, and the webinar gave us a chance to inform them about Owens Corning glass fiber reinforcements including our patented Advantex® (E-CR) glass,” said Don Sage, Senior Product Engineer.

Customers find the Owens Corning name very valuable in the composite market, and its name, as well as its expertise help customers grow. “Webinars are a fantastic way of reaching out to current and potential customers,” said Marketing Leader Bryan Minges. “Many valuable leads were developed from this effort and will help our customer grow, thus strengthening the relationship between our two companies,” said Minges.

**Information about the Structural Thermoset Compounds: Technology and Applications webinar is located at [machinedesign.com/training/](http://machinedesign.com/training/) in the Materials section. Other Owens Corning webinars are located at [www.reinforcedplastics.com/webinars/](http://www.reinforcedplastics.com/webinars/).**

# Zhonghao Technology Competitive Advantage for Corrosion Resistance Applications



Hangzhou Zhonghao Technology Co., Ltd. designs and produces nonmetallic tower devices and column internals. The company also produces composite pipes, fittings, and storage tanks. Within the past year, Zhonghao Technology began using FRP (fiberglass-reinforced polymer) containing Owens Corning's Advantex® glass in its towers.

Advantex® glass, Owens Corning's patented corrosion resistant E-CR glass not only provides increased mechanical properties compared to standard E-glass and E-CR glasses, but also provides the corrosion resistance ISO 2078 recommends for acid environments. Zhonghao Technology believes using Advantex® glass separates them from their competitors. According to Chief Engineer, Tong Xinhang, "We have been using traditional E-glass fiber from a domestic factory in the past but through Owens Corning's introduction and promotion, we realized there is a vast difference in the performance between traditional E-glass and Advantex® glass. Advantex® glass fiber provides better contribution and guarantee to product performance and lifespan."

Zhonghao Technology's General Manager, Huang Yiping, acknowledges that the company's initial costs will increase with using Advantex® glass fiber reinforcements compared to traditional E-glass fiber used by most of their competitors. However, he stresses that the investment is worthwhile considering that Advantex® glass fiber makes their FRP products stronger and longer-lasting.

Zhonghao Technology's Assistant Sales Manager, Song Yongquan, further added, "Most customers in China focus on product prices and wish to lower costs through procurement.

**“What sets us apart is that we are the first to recommend the superb performance of Advantex® reinforcement to our customers and persuade them to accept the increase in initial cost.”**

This is to ensure that we can provide guaranteed products of the best performance in high demanding applications.”

The products produced by Zhonghao Technology are used in industries including chemical and fine chemical; pharmaceutical; metallurgical processing; polycrystalline silicon and organosilicon; and polyvinyl chloride. The largest market for the FRP towers is the chlor-alkali chemical industry. With a dedication to quality and a commitment to research and development, Zhonghao Technology strives to provide these industries with innovative products and competitive pricing.



Courtesy Hangzhou Zhonghao Technology Co., Ltd., China

**For more information about Zhonghao Technology, please visit or contact [www.ifs-frp.com](http://www.ifs-frp.com) or [sales@ifs-frp.com](mailto:sales@ifs-frp.com)**

# New Reinforcement Solutions for Spray-Up Applications

The market for spray-up processes is very diverse, with applications that include marine, sanitary, swimming pools, and transportation. These applications are driven by the need for optimum wetting to give a good surface finish and mechanical strength of the final part. Since this is a labor-intensive operation, the ease of processability is also very critical. To satisfy global needs, Owens Corning is bringing to the market a range of optimally performing solutions comprising OptiSpray™, OptiSpray™ H, and OptiSpray™ F rovings.

The OptiSpray™ H roving has the added benefit of great lay down in large, flat molds with a consistent surface finish. And, the OptiSpray™ F version is specially designed for applications that require faster wet out in complex molds either due to the resin system or in high throughput operations. All three products work optimally in neat systems, as well as in filled resins.

The OptiSpray™ reinforcements also provide the unique advantage of easier rolling due to their flat lay down and provide better air release, which results in productivity gains. Additional productivity gains are also possible due to the fast, smooth pull of the rovings through the gun with minimal to no gun stoppages. Depending on the type of application and resin system, some customers will experience lower resin consumption either with the OptiSpray™ or with the OptiSpray™ F products. In certain cases, the glass content of the part may go up by 10% - 15% resulting in mechanical property benefits in addition to the reduced expenses for resin consumption.

The OptiSpray™ reinforcement range will be available beginning in September 2012.



The OptiSpray™ product line uses Advantex® glass fiber, which combines the electrical and mechanical properties of traditional E-glass with the acid corrosion resistance of E-CR glass. The OptiSpray™ roving has been designed to provide optimal performance for spray-up applications where standard wet out speed is preferred in complex molds.

**To learn more about OptiSpray™ solutions, visit <http://composites.owenscorning.com>**

Transforming the World with Advanced Solutions



INNOVATIONS FOR LIVING™

**OWENS CORNING COMPOSITE MATERIALS, LLC**  
ONE OWENS CORNING PARKWAY  
TOLEDO, OHIO, USA 43659

**1-800-GET-PINK™**  
**[www.owenscorning.com](http://www.owenscorning.com)**

Pub. No. 10017768. August 2012. THE PINK PANTHER™ and ©1964-2012. Metro-Goldwyn-Mayer Studios Inc. All Rights Reserved. The color PINK is a registered trademark of Owens Corning. ©2012 Owens Corning. All Rights Reserved.



## MARKET VISION FOR COMPOSITE SOLUTIONS

Published four times each year by Owens Corning Composite Materials, LLC. E-mail feedback and suggestions to [MarketVision@owenscorning.com](mailto:MarketVision@owenscorning.com).

**Executive Editor:** Carmelo Carrubba  
[carmelo.carrubba@owenscorning.com](mailto:carmelo.carrubba@owenscorning.com)

**Managing Editor:** Emmanuelle Mangelot  
[emmanuelle.mangelot@owenscorning.com](mailto:emmanuelle.mangelot@owenscorning.com)

EURO RSCG 360 - RCS MANTERRE 780 443 707 - 207232 - © Scott Leigh / iStockphoto.com - © Reuters - Corbis - Getty Images. © iStock