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EDITORIAL

The New Frontier: HELPING YOU LEVERAGE OPPORTUNITIES IN THE BRIC COUNTRIES



As an industry, we've grown, on average, faster than global gross domestic product (GDP) as the world has been receptive to the stronger, lighter, more durable value propositions composite materials and our companies delivered.

In the past 10 years, however, the BRIC countries – Brazil, Russia, India and China – have surged to the forefront of the world's conversation – and our industry as well. Today, those four countries make up more than one-third or nearly 35 percent of total composites demand.*

For all of us in composites, the BRIC countries have tremendous opportunities for the expansion of our industry. Government spending alone is expected to create continued growth for the foreseeable future, until consumer spending ultimately takes over.

Supporting your growth anywhere in the world is certainly a topic that is critically important to Owens Corning and our 37 plants in 15 countries, including nine facilities in the BRIC countries supplying both reinforcements and technical fabrics.

In addition, we are currently building new state-of-the-art E-CR fiberglass reinforcement facilities – a greenfield plant near Shanghai, China, and expansion of our reinforcements and fabrics facility in Gous-Khroustalny, Russia. This fall, we will be available to you at major trade shows in the BRIC countries, including China Composites Expo, JEC Composites Asia and Feiplar Composites in Brazil.

Owens Corning is committed to supporting its customers in the BRIC countries. Two of them are featured in this magazine – Edra in Brazil and Shanghai Aeolon Wind Energy in China. If you are not already participating in the BRIC countries, we look forward to seeing you there in the future!

Sincerely,

Group President

Composite Solutions Business

BRIC Country Highlights

- The BRIC countries – Brazil, Russia, India and China – now account for more than one third or nearly **35 percent** of total composite demand
- Between 2005 and 2015, BRIC countries' GDP growth is expected to average **four times faster** than developed countries
- BRIC country industrial production is expected to average **six times higher** than developed countries in the same period
- The **consumer segment** is small as a percentage of total GDP but is expected to become much more important in driving demand as the countries develop
- **China** has been the main growth engine and now is largest glass fiber market in the world
- **China** became the largest single wind energy market in 2009, surpassing the U.S.
- **Water projects** are clearly driving composite market growth in the BRIC countries, followed by power and energy, and industrial
- In **Russia**, the government is expected to spend \$7 to 8 billion on infrastructure improvements in the next few years
- **India** will likely continue to become more important and a much larger market in the next five to 10 years
- BRIC country composite use in **transportation** is expected to grow as the countries increase their fuel efficiency standards

For more about composites and the BRIC countries, visit:
www.ocvreinforcements.com/library.asp



03 Edra Expects Sweet Future with Biofuels

For more than 30 years, Brazil has been the world leader in ethanol production. That success is expected to continue as several large petroleum and chemical companies are reportedly investing more than \$20 billion there in advanced biofuels. For Luiz Antonio Pena, director at Brazilian fiberglass pioneer Edra, that news is sweet indeed.

Founded in 1974, Edra makes large-diameter pipe, commercial and industrial storage tanks, and transportation tanks attached to truck chassis, all of which can be used in the production of “sucro alcohol” for ethanol fuel. Sucrose alcohol is currently the strongest market for the company’s products.

“*The sucro-alcohol market in Brazil has positive momentum today due to high internal and external demand for alcohol and sugar,*” says Pena.

“There are many transactions taking place with large investments and acquisitions from strong groups such as Petrobras, Odebrecht, Cosan, etc. New sucro-alcohol plants are also starting operations.”

Fiberglass-reinforced polymer (FRP) tanks are used extensively for transporting both citrus and

sugarcane pulp, which are acidic and corrosive to many materials such as steel and aluminum. FRP tanks provide lightweight and corrosion-resistant containers.

Established to serve the marine and automotive markets, Edra leveraged its FRP experience to make transportation tanks beginning in 1984. Since then, the company has supplied more than 2,500 tanks to the sucro-alcohol market.

The company now has 450 employees operating four filament-winding lines and a hand lay-up operation in a 9,000-square-meter factory (10,764 square yards). The facility is in Ipeúna, São Paulo state. OCV™ Reinforcements provides roving from two facilities within the state.

“Our business is doing very well considering the economic environment,” says Pena. “We recently landed a contract to provide FRP pipe for a large treatment station for water and sewage, so we are having success in other markets besides sucro alcohol. Turnover this year is expected to reach 120 million Brazilian real (US\$ 64 million).”

For more about Edra, visit www.edra.com.br.

04 PITSA Picks Advantex® E-CR Glass for Critical Project

On the main island of New Caledonia in the South Pacific, four large composite storage tanks sit serenely doing a critically important job. They are protecting an idyllic environment while holding hydrochloric acid and nickel chloride at a mineral extraction plant for one of the world's largest nickel mines.

“The chemicals stored in the tanks are very aggressive and the barrier reef that surrounds the island is a UNESCO World Heritage Site. We were shipping the tanks more than 6,000 nautical miles. That made it important for us to have good partners like Owens Corning, with the products and support we needed to do the job right.”

The two largest tanks each weighed 120 tonnes empty and were the biggest ever made by PITSA. They may be the biggest composite tanks ever shipped in one piece. The floors were six inches thick and the walls were more than three inches thick in some areas. All of the tanks were domed top, flat bottom, and the largest were stiffened with three filament-wound ribs.

“We were always pushing the limits of what was possible in shipping,” says Sainz. “The crane we used was the largest in Mexico. The barge was the largest available and the ship was one of the largest of its kind. PITSA even had to have the channel dredged to accommodate the loaded barge.”

Sainz says the Advantex® glass reinforcement ran well and wet-out quickly. “Our customer was also pleased to know that we were using a corrosion-resistant E-CR glass throughout the laminate because the spec called for this type of glass just for the corrosion barrier.”

The four FRP tanks were fabricated by Plásticos Industriales de Tampico (PITSA), of Tampico, Mexico. The tanks range in diameter from 10 to 14 meters and in height from 8 to 18 meters. For the glass-reinforced polymer construction, the company used Advantex® E-CR glass fibers from OCV™ Reinforcements.

“We had to use the best materials available,” says Engineer Francisco Sainz Inguanzo, general manager, PITSA.

“There is a lot of risk for a company like ours with such a big project,” continues Sainz.



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**For more about PITSA, visit: www.pitsafrp.com.
For more about Advantex® E-CR glass fibers visit
www.owenscorning.com/composites/aboutAdvantex.asp.**

05 Three Questions for Shanghai Aeolon

Shanghai Aeolon Wind Energy Technology Development Co., Ltd. is one of the fastest-growing wind blade fabricators in China. Founded in December 2007, the company now has 12 production lines and more than 800 employees.

To obtain the company's perspective on working with the OCV™ businesses for fiberglass reinforcements and fabric, Market Vision posed three questions to Hu Wenlong, president of Shanghai Aeolon.



Aeolon Quick Facts

- Founded in Dec. 2007 and headquartered in Shanghai, China
- Named for Aiolos (or Aeolus) mythical Greek king of the winds
- First wind turbine blades delivered Feb. 23, 2009
- Now operating 12 production lines for 37.5- and 40.3-meter blades with annual output of 700 sets (1050 MW capacity) and 800 employees, making it Aeolon one of the largest blade manufacturers in China
- Privately owned with annual turnover is approximately € 70 million (RMB 0.7 billion; US\$ 86 million)
- The company's blades are certified through Germanischer Lloyd GL

Why do you use Advantex® glass fabrics in making your wind blades?

When we started the company we licensed technology from Aerodyn Energiesysteme GmbH, Germany, an engineering firm active in wind energy since 1983. Owens Corning is a qualified supplier of reinforcement solutions for the blade designs we make. The specific fabrics provided by Owens Corning based on Advantex® glass provide us with both the consistent quality we need to optimize our production and excellent properties in modulus and strength in our epoxy resin system.

How does Owens Corning make a difference to you as a supplier?

Owens Corning supplies high-performance material with a consistent and assured quality and supply commitment. This is the key success for our production.

Aeolon also now has seven patents for its own development work and another three patents pending. Owens Corning has supported our development work with knowledge and experience in fabrics and processes working closely with Li, Chuansheng, our technical vice general manager. Ideas and solutions were exchanged to improve production efficiency and reduce waste.

What are your expectations of Owens Corning?

Our expectations of Owens Corning are a commitment on consistent quality, continuous improvement, cost control and focusing on our customized requirements. We expect Owens Corning to continue to help us understand how their solutions contribute to our laminates and the finished wind blades.

For more about Shanghai Aeolon visit: www.aeolon.com.cn/cn

06 Owens Corning Japan Helps Customer Reduce Cost

Owens Corning Japan Ltd. won an award this year from Sekisui Home-Techno Company for helping the company improve performance and lower its operating cost.

Headquartered in Osaka, Sekisui Home-Techno produces and distributes prefabricated baths. The company uses a sheet molding compound (SMC) that it asked OCV™ Reinforcements to provide.

When Sekisui begins the first run of a product, there are usually some defective pieces that cannot be sent to customers. To convert the substandard pieces into first class parts, surface defects must be removed and the parts polished and painted. The closer the run-rate comes to 100 percent, the fewer defective pieces – saving cost and time.

When Sekisui originally began using SMC in 2005, the first run-rate was 70 percent. Owens Corning Japan worked closely with Sekisui and the companies tried several changes to improve the run-rate and four years later, the rate had improved to 90 percent.

said Yusuke Matsumoto, account sales manager, specialties business, Owens Corning Japan.

Mitsuru Akagawa, senior product developer, Owens Corning Japan, added: “We analyzed the factors of the defective pieces, improved our materials and the molding conditions and made several molding tests to check the result. We had many meetings and worked closely with Sekisui. Our goal is to help our customers prosper.”

A Sekisui Home-Techno representative said the company appreciates Owens Corning Japan’s tireless contribution to their cost-reduction activity.

“We will continuously keep this great business partnership with Owens Corning in the future,” said the Sekisui spokesperson.

For more about Sekisui Home-Techno visit: www.sekisui-hometechno.co.jp

“To achieve this rate was a very tough task since Sekisui Home-Techno has a very strict appearance standard,”



07 Fibre Net Catching Attention and Revenue

The area where Fibre Net S.r.l. is headquartered in the northeast of Italy has been inhabited since the Neolithic age some 5,000 years ago. Perhaps living in such an environment prompted the company's founders to develop composite products for restoring the country's historic architecture and infrastructure.

After many years of success making pultruded shapes that upgrade aging structures both statically and seismically, the company's technical team developed another composite product that is now generating increased attention and revenue – Fiber-Reinforced Polymer (FRP) mesh or nets for reinforcing concrete.

The FRP nets are manufactured with continuous Cem-FIL® alkali-resistant (AR) glass fibers from OCV™ Reinforcements. The fibers are pre-tensioned and

impregnated with thermosetting epoxy-vinyl ester resin and woven with multiple twisted warp and flat weft strands embedded between warp strands. The strands average about 3 mm (0.12 inches) in width.

In the restoration and salvage of buildings, FRP nets contribute high mechanical strength, chemical resistance and thermal insulation. They are light and thin enough to enable fast, easy and low-cost installation.

“At the moment, Fibre Net is experiencing a strong growth trend, both in terms of visibility and in terms of turnover,” says General Manager Cecilia Zampa.

“This is the result of considerable research and innovation in composite materials for the building sector, and an outcome of our strong activity in ‘training the market’ – making the market more aware of composites in the building sector,” she explains.

Zampa says the company is benefiting from the unique aspects of the mesh product.

“It is similar to traditional consolidating techniques done up to now with steel meshes, but with a lighter and thinner product, FRP mesh is easy to move. It has good properties and meets the technical standards for concrete construction in NTC 14.01.2008.”



For more about Fibre Net S.r.l., visit www.fibrenet.it.

For more about Cem-FIL® AR glass fibers, visit www.ocvreinforcements.com/CemFIL.



08 Owens Corning Introduces FliteStrand® S Reinforcements

Owens Corning recently launched an addition to its growing family of high-performance glass fibers – FliteStrand® S reinforcements for aerospace applications.

The new product was introduced at the conference and trade show hosted by the Society for the Advancement of Material and Process Engineering (SAMPE), in Seattle, Wash., United States. The launch marked the company's increasing focus on the aerospace market.

Owens Corning, the original inventor of S-glass, has taken high-performance S-glass availability and affordability to a new level with its revolutionary direct melt technology. The first products made with the new technology – ShieldStrand® S and XStrand® S reinforcements – were launched last year.

“The initial response to FliteStrand® S reinforcements is very encouraging,” said Steve Kokolios, aerospace key account manager for OCV™ Reinforcements. “We had in-depth conversations with many potential customers at SAMPE and they are all keenly interested in the opportunities made possible by FliteStrand® S products.”

*Owens Corning calculations using data from several public sources

Aircraft manufacturers are increasingly turning to composite materials to reduce weight and fuel consumption. With more than 18,000 active commercial passenger and cargo aircraft flying some 38 billion miles a year globally, just a 1 percent reduction in fuel consumption would amount to 16 million or more barrels of oil annually.*

With the advent of the latest generation of aircraft from Airbus and Boeing, composites today include major structural components such as wing boxes, fuselage sections and engine fan blades. FliteStrand® S can play a vital role in these new applications, whether stand-alone or hybridized with other reinforcements.



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Presentation at AIRTEC 2010

FliteStrand® S and other high-performance reinforcements from Owens Corning will be featured in a presentation at AIRTEC 2010, Nov. 2 and 3, Frankfurt, Germany, by Eric Dallies, high-performance reinforcement business leader - Europe, OCV™ Reinforcements.

For more about FliteStrand® S reinforcements visit:
www.ocvreinforcements.com/hp/aerospace.asp



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