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FIRST QUARTER 2011

Transforming the World with Advanced Solutions

OCV™ Reinforcements | OCV™ Technical Fabrics | OCV™ Non-Woven Technologies

EDITORIAL

FOCUS REMAINS ON MARKET TRANSFORMATION AND GROWTH

After leading the Owens Corning Composite Solutions Business for eight years, Chuck Dana is now leading the company's Building Materials business. We wish him all the best in that important assignment and thank him for his many contributions to our company and our industry. I look forward to working with you and building on the base that Chuck's leadership provided.

According to market analysts, 2011 should be another positive year for the composites industry as global economic recovery continues. All regions are expected to experience positive growth, and the strength will vary by region and country, particularly as inventory levels continue to be rebalanced throughout the supply chain. To provide more information about your part of the world, we asked our regional business leaders to share their perspectives in the following pages of this magazine.

As your industries recover and demand for composites grows, we continue to increase capacity through productivity improvements, starting up additional lines and adding new facilities. Our most recent action in this regard was the December start-up of the new composites plant in Hangzhou, China, which is operating in addition to our nearby original plant.

Our theme, "Transforming the World with Advanced Solutions" highlights our commitment to our industry's heritage of growth as we develop applications that replace traditional materials with composite materials. The OCV™ businesses will be introducing solutions that enable superior performance and new applications. Winners of the company's Composite App Challenge will be announced in early February and will showcase more innovative ideas for continuing market growth. Visit our website: www.occompositeappchallenge.com to read about Challenge submissions and to find out about the winner of the $200,000 development prize.

Read on to learn how some of our customers are winning in the market with Owens Corning solutions, and know that we are ready to help you, too. We remain committed to serving your needs and delivering value to help your businesses prosper.

Sincerely,

Arnaud Genis
Group President
Composite Solutions Business

New group president, Owens Corning Composite Solutions Business

Effective Dec. 15, Chuck Dana was appointed group president, building materials at Owens Corning and Arnaud Genis was named to succeed him as group president, composites. Dana, 55, joined Owens Corning in 1996 and led the company's global composites business since 2002. Genis, 46, comes to the job of composites group president from his previous position of vice president and managing director, composites Europe. He had been in that role since joining the company in the acquisition of the Saint-Gobain reinforcements and composite fabrics businesses in 2007. Prior to the acquisition, he was president of the global reinforcements and textile solutions business. He has more than 20 years of experience in a variety of global composites roles.

03 Recovery Underway But Multi-Speed

For a quick look at the global economy, here are some "headlines" from IHS Global Outlook:[1]

- The recovery has slowed but is still on track
- The temporary effects of fiscal stimulus and inventory build-up produced above-trend growth in 2010
- In the developed world, post-crisis healing will result in sluggish growth for some time but probably not a "double-dip"
- In slow-growing parts of the world, inflation is not a problem, interest rates are on hold and currencies are mostly falling
- In fast-growing parts of the world inflation and interest rates are rising and currencies are mostly rising

Positive forces globally include rising employment, real income growth, stock market recovery, mild inflation and low interest rates. Negative forces include high unemployment, reduced housing wealth, tight credit and high debt burdens.

"What does this all mean for composites? According to industry analysts, all regions are expected to experience positive growth in 2011 but the strength of that growth will vary from region to region."

Consumer-driven markets will be the key to driving composites demand. Those markets include power and energy (developed countries excluding wind), transportation, housing, most of industrial (90 percent), consumer and aerospace.

Markets more influenced by government spending and therefore expected to grow more slowly include power & energy (developing countries and all wind), water distribution, some industrial (10 percent) and defense.

Markets expected to have the strongest growth in the Americas in 2011 are power and energy (10 percent), industrial (7 percent) and water distribution (5 percent). The strongest markets in Europe are expected to be industrial (7 percent) and consumer (2 percent). In Asia, the fastest growing markets are expected to be power and energy (15 percent), industrial (15 percent) and consumer (12 percent).[2]

While the use of glass fiber-based composites has traditionally grown at 1.5 to 2 times the rate of growth of GDP, the continuation of this trend will require the development of new application space to grow beyond today's market.

[1] The Global Outlook: A Very Mixed Bag, Nariman Behravesh, chief economist, IHS, Sept. 21, 2010

[2] Ibid

04 Growth Slowing But Still Strong in China, India and Korea

The Asia Pacific region experienced strong growth in 2010, especially in China, India and Korea. One weak spot was Japan, which saw strong growth in the first half of the year but slowed down in the second half.

Many analysts are expecting slower-but-still-healthy growth for most of the region in 2011. According to IHS Global Outlook,[1] China's real GDP growth may ease from 10 percent to about 8 percent, India may remain flat at about 8 percent, and Korea may ease back from more than 6 percent to less than 4 percent growth.

The good news for reinforcement customers in Asia Pacific is that slowing growth and new production capacity, such as the new Owens Corning facility in Hangzhou, P.R. China, are expected to ease the pressure on supplies of single-end roving. Chopped strand reinforcements are expected to remain tight but adequate as a result of Owens Corning productivity improvements in the region.

"The biggest change in the composite market in Asia Pacific in 2011 is likely to be the greater availability of single-end roving," said Sangkyoo (S.K.) Han, Ph.D, vice president and managing director, Asia Pacific, OCV™ Reinforcements.

Han also said *"two new applications are expected to help further transform a portion of the region's traditional materials market into composites. One is a ballistics application and the other is a compressed natural gas (CNG) pressure vessel."*

"The ballistic application will use ShieldStrand® high-performance glass fiber reinforcements," said Han. "The pressure vessel will be made with corrosion-resistant Advantex® E-CR glass reinforcements. Both of these applications expand the use of recent technology developments."

Han also expects to see greater use of high-performance reinforcements in wind energy as turbine manufacturers increase the length of their blades.

"We may not have the same high level of growth we experienced in 2010 but in many ways the year 2011 could be more satisfying in terms of balanced supply and demand, and continuing to transform materials to composites," added Han.

[1] The Global Outlook: A Very Mixed Bag, Nariman Behravesh, chief economist, IHS, Sept. 21, 2010

New Plant in China Starts Operations

A brand-new Owens Corning facility making single-end roving started operations in December in Yuhang, Hangzhou, PR China.

The new plant is operating in addition to the company's original plant nearby. The team building the facility had been working at a fast pace to meet customer demand for single-end roving.

Production from the plant will be used primarily in the local market. The company was importing glass fiber reinforcements in volumes nearly matching the capacity of the new facility. Production there will now replace a portion of those imports and free up some capacity in Europe and the Americas to meet the needs in those markets.

"Owens Corning is showing its strong commitment to the growing Asia market and its customers," said S.K. Han, vice president and managing director, Asia Pacific. "This is a key milestone for our development in the region. We will be able to accelerate our progress in the Asia market and better serve the growing needs of our customers."

05 R&D Key to Growth for Pultron Composites

Pultron Composites, Ltd. was founded 30 years ago in New Zealand to make electrical fence posts for the local agricultural market.

The company didn't stay local very long because founder Peter Holdsworth, an innovative engineer, invested in research and development (R&D) and soon developed fiberglass-reinforced polymer (FRP) reinforcement and rock-bolts for mining, tunneling and civil applications. The company became a specialist in pultruded products including central strength members for optical telecommunications cable, high-performance round rods and reinforcing bar for concrete, and developed expertise in high-performing fatigue- and creep-resistant pultruded profiles.

Pultron focused on exports and today sells about 80 percent of its products outside New Zealand. The company recently built a facility in Dubai, UAE, to make product closer to some of its customers and serve the corrosion market in the Middle East. The plant is producing custom profiles and will soon add reinforcing bar for concrete.

"The FRP reinforcement rods for concrete, branded Mateenbar™ is a result of more than 20 years of R&D and application experience, mostly in the Australian coal mining and tunneling industry," said Managing Director Jasper Holdsworth.

In 1985, Pultron worked with DuPont Australia to develop a reinforcement system that addressed the shortfalls of steel. In 1990, Pultron worked with BHP to develop a world-first technology combining pultrusion and extrusion. The resulting product was a reinforcement system to stabilize high-movement rock and coal seams, dramatically improving mine safety in difficult geotechnical conditions.

Pultron uses corrosion-resistant glass fiber reinforcements made with Owens Corning Advantex® E-CR glass. "The company has worked with Owens Corning for many years and appreciates their efforts to understand the technical requirements for developing high-performance pultrusions," said Holdsworth.

Pultron now employs approximately 80 staff, and to complement the pultrusion facility operates a Composites Research Laboratory and Research Engineering Department. Many of the pultrusion products manufactured require specialized finishing operations or over-molding and the in-house development of the necessary equipment allows for efficient automation to keep production costs down.

The team holds many advanced degrees in engineering, physics and chemistry.

"We have tried to attract some of the finest technical experts available," explained Holdsworth. "We also have some long-serving staff without formal education who have studied our processes for many years and are extremely clever or perceptive to subtle aspects of our technology. We continue to push the envelope with regard to high-performance and high-quality FRP pultrusions and Owens Corning has been an essential partner to achieve a leading technical position in our niche of the market."

For more about Pultron Composites, visit: www.pultron.com

06 New, Enhanced Products, Applications Aim For Growth

The Americas region saw continuous economic improvement in 2010 versus 2009. In North America, improvement was stronger in the first two quarters and slower in the end of the third quarter and the fourth quarter, mainly because of a reduction in consumption and investments. South America continued strong throughout the year with no sign of reduction other than government concerns with inflation in Brazil.

"What made the overall composites market good in Americas in 2010 was the diversity of applications and the combination of different trends in the countries," said Marcio Sandri, vice president and managing director, Americas, OCV™ Reinforcements. "There wasn't only one country or a few end-use markets that made the difference; it was really a combination of them all that made a positive trend for 2010."

Sandri said a significant challenge during the year was increasing capacity to match demand. "We took Amarillo (Texas) to the highest capacity level since that operation was established; we challenged Tlaxcala (Mexico) to keep increasing capacity month after month; we took Guelph (Canada) to full capacity and we cranked up production in Rio Claro (Brazil) after making a needed repair early in the year.

"We also called on Besana (Italy) to re-start an idle CFM (continuous filament mat) line in record time to support the unexpected needs of the North American market after other suppliers experienced production issues and couldn't serve all the demand requested."

This year, Sandri says analysts are expecting continuous but average or slow growth in the region. "Industry forecasts[1] call for growth equal to or slightly lower than 2010 in North America at 2 to 3 percent, and slightly slower in Latin America due to concerns with inflation but still a robust 5+ percent," he said.

Sandri sees market transformation to composites continuing with new and enhanced reinforcement products, and new applications.

"We are excited about the possibilities for FliteStrand® and ShieldStrand® reinforcements. New non-woven products include veils for duct board and heavy commercial wallboard." Sandri explained.

"Entries in the Composites App Challenge are bringing new ideas and markets to composites, and enhancements to traditional products that have the potential to make a difference for the industry include roving for translucent panels, direct roving for wind and pipe, and wet- and dry use chopped strands for asphalt shingles and structural automotive applications, respectively," added Sandri. "We will continue improving our innovation capabilities for new applications and markets for composites."

[1] The Global Outlook: A Very Mixed Bag, Nariman Behravesh, chief economist, IHS, Sept. 21, 2010

07 Owens Corning Reinforcements Help Spa Manufacturer

Master Spas had to find other work to keep its repair specialist busy after switching to Advantex® glass reinforcement for the critical first layer of composite material in its swim spas. The company once had an unacceptable leak rate which kept the specialist busy full time. Today, the leak problem has been completely eliminated.

Director of Manufacturing Michael Rees said he was frustrated by the time and expense of repairing leaks. Water would typically appear at a bottom corner of a swim spa but the source could be a considerable distance away.

"We looked at everything to find the root cause of the leaks," explained Rees. "Our people were doing everything we asked them to do but the problem persisted."

Rees said the solution was finally found by accident.

"We wanted a second source of supply and bought some Owens Corning roving made with boron-free Advantex® E-CR glass. We noticed a difference immediately."

"The Owens Corning product is softer than the glass fiber we had been using," continued Rees. "The Owens Corning roving lays down and wets out better than the other glass. The result eliminates the 'straw effect' where a resin-free channel is created that water can move through."

The company's wet-out teams noticed that the new fibers don't stick up as much as the ones they had been using. "We have a veteran on each team who takes a final look at the laminate and rolls out any fibers that aren't laying down properly," said Rees. "That work has just about been eliminated since we started using the Owens Corning product."

Rees says it is obvious that the Owens Corning reinforcement is responsible for the decline in composite laminate leaks. "That was the only change we made," he said.

Laminate leaks are a bigger risk for spa makers these days with so many holes cut for water-jet nozzles and accessories. Today's units can include lighting, sound systems and even televisions. Master Spas cuts nearly 100 holes in a regular (non-swim) spa, with one 10-foot model requiring a total of 194 holes.

Swim spas are a special problem because they are larger and the pumps generate more force. The propulsion unit requires five 12" square holes for grates at one end of the unit so the system can create the current. Multiple large grates provide a broad, even current that feels natural to the swimmer but creates tremendous hydraulic force in the vessel.

The original H2X swim spa by Master Spas is 16' 9" long and holds 2,500 gallons of water. That means there is more than 10 tons of weight pressing on the bottom and sides, and all of that water is trying to get out. With the help of Owens Corning reinforcement, Master Spas will keep every drop where it belongs – inside the swim spa.

Master Spas did make an international splash in the fall of 2010 by rolling out a line of "Michael Phelps Signature Swim Spas by Master Spas." Holder of 14 gold medals, Phelps is partnering with the company on six swim spas for homes and another line for fitness centers, universities and physical therapy centers.

For more about Master Spas, visit www.masterspas.com

08 Recovery Momentum Continues Building in Europe

While the overall economic recovery in Europe during 2010 was modest at about 1.8 percent, it represented a substantial turnaround from negative 4 percent in the prior year and had Owens Corning facilities operating near full capacity[1]. The turnaround started in second half of the year and continues to build momentum in early 2011.

Product supplies were tight in Europe during the second half of 2010 and analysts expect that situation to continue in 2011. The construction and industrial end-use-markets are expected to be the strongest. The most robust economies are expected to be in countries with the strongest financial position, such as Germany, and also the so called "emerging countries of Europe" – Russia and the countries of the Confederation of Independent States (CIS).

"The growth we are seeing is in core activities and core business; it is not a result of stimulus programs or other short-term factors," said Kim Howard, vice president and managing director, Europe, for OCV™ Reinforcements.

To serve European customers, the business stopped exporting product from the region in 2010, began importing product from other regions and restarted capacity at several locations. In addition, a larger replacement line being built in Gous-Khrustalny, Russia is expected to start production in 2011.

"We are also working with customers to fully understand what they value and what will help them provide differentiated value to their customers. Through these efforts we enhance our strategic partnerships and help our customers win."

said Howard. "To continue to transform the materials market to composites, we need to provide the products and solutions that enable our customers to compete effectively with aluminum, steel and wood," she explained.

"Specialty reinforcements will continue to be a focused area for growth in 2011," continued Howard. "Our Cem-FIL® alkali-resistant (AR) glass is an excellent substitute for steel in concrete, for example. Higher-performing glass reinforcements can compete effectively with carbon in wind blade applications, and Advantex® E-CR glass reinforcements provide unsurpassed corrosion resistance.

"All of this, combined with a strengthening economy and growing market for composites, should provide another positive year for our customers in 2011," concluded Howard.

[1] IHS Global Insight

09 Bioplast Strategy Producing Significant Growth

A relatively young company in Russia has become a significant manufacturer of glass fiber-reinforced polymer equipment by adhering to two basic principles: using materials supplied by leading producers and offering professional customer service.

Founded in 2007, Bioplast, LLC started with the production of equipment for septic systems. At present, the product range includes dozens of items including pipe and tanks for diesel oil, sewage and storm water systems. Their products are sold under the brand name Helyx™.

The company had turnover of 50 million rubles (USD1.64 million) in 2008, its first full year of operation. By 2010, revenue had grown to four times that amount and employment increased to nearly 55. The company now operates three production lines in a 4,200-square-meter facility (45,200 square feet). Bioplast also works with state research and project institutes to be able to participate in large national projects.

Pipe production is now the company's priority. It has also recently invested in a new winder for large-diameter vertical tanks (4 to 25 meters or 13 to 82 feet) and plans to develop that application in 2011.

The company has their own special system for order processing. Every incoming order goes straight to the engineering team that will work on the development of the equipment ordered. The client can count on the professional involvement of the company's technical engineers not only when the order is being produced, but also later when the equipment is in use.

The second half of the company's success is the use of the best raw material.

> *"We prefer to empirically pick just one trustworthy supplier for each type of the raw material,"* says Sergey Abramenko, commercial director.

"We're very pleased to work with Owens Corning. OCV™ Reinforcements is a local supplier and leader in the field, providing high quality products, developed technology and long-term cooperation based on mutual trust."

During 2010, Bioplast benefited from conversion of the Owens Corning factory in Gous-Khrustalny, Russia, to corrosion-resistant Advantex® E-CR glass.

"Our tests have shown that reinforcements made with Advantex® glass have higher mechanical strength compared to standard E-glass, and we get excellent fiber impregnation during the winding process," said Abramenko.

For more about Bioplast, visit: www.helyx.ru/

10 Developing New Fabric Solutions to Help Customers

OCV™ Technical Fabrics is developing advanced solutions to help its customers transform the materials market with new applications. A prime example is Ultrablade™ fabric developed to enable customers to produce longer and lighter wind blades.

"The anticipated trend to longer blades is really happening," said Mark Neville, vice president and managing director, OCV™ Technical Fabrics.

"During 2010, the wind energy market was soft in Europe and North America but buoyant in China, India and Brazil," continued Neville. "Market analysts expect wind energy to recover steadily in Europe but the North American situation remains uncertain at the moment.

"Wind energy growth has stalled in the U.S. and we are concerned about that because it is a large market and we don't see strong investment in the sector at the moment," continued Neville. "At least some of the slowdown is due to the current economic situation reducing demand growth for energy."

The Technical Fabrics business is also working on solutions for the in-situ relining of pressurized pipe and fabrics for thermoplastic composites. "We see great promise in both these markets," added Neville.

During 2010, OCV™ Technical Fabrics set up a fabrics excellence center at its facility in Zele, Belgium. The 5,500-square-meter (about 60,000 square feet) facility is now fully operational with both pilot- and full-scale state-of-the-art production equipment for developing, testing and evaluating new fabric technologies before production and use in customer processes.

In addition to equipment for knitting, stitching and assembling of multi-axial fabrics, the center also has a laboratory for making and testing composite samples made with new fabric technologies used in infusion and other closed-mold processes.

"Our focus continues to be on working with our customers to help them differentiate and grow their businesses," continued Neville.

"Our new excellence center will help us jointly develop new solutions with our customers in the growth markets in composites. It will also allow us to raise the quality and consistency of the fabrics manufacturing process to the next level."

New Products


©istock

OC HiLight™ roving for high translucency

OC HiLight™ multi-end roving is the new benchmark product for translucent panel applications. This new product has excellent properties for transparency, chop-ability and fast wet-out. Made with Advantex® E-CR glass, OC HiLight™ roving incorporates a proprietary sizing that provides unmatched clarity. When compared with competitive products, panels made with OC HiLight™ roving show significantly reduced appearance of white fibers, less air entrapment and less light distortion.


Pict. of Rivierasca S.p.A, IT

OC HiLight™ roving also provides superior fiber distribution, less fiber spring-back and better wet-out, allowing higher glass percentages in finished laminates and enabling panels to achieve strength and stiffness requirements with less thickness and reduced resin use.

For more about OC HiLight™ roving, contact hans.vandersteen@owenscorning.com.

Ultrablade™ fabrics for high performing wind blades

Ultrablade™ high-performance fabrics have been introduced to help enable the transition to longer, lighter and stiffer wind turbine blades. Commercially available since January, the new solutions can help designers remove nearly a metric ton of reinforcement and resin from 2.0 megawatt wind turbines compared to same-size blade sets made with traditional E-glass.

Compared to standard fabrics, Ultrablade™ fabrics in epoxy resin can:

- Reduce spar weight by up to 18 percent while keeping length constant
- Increase blade length by up to 6 percent
- Improve blade stiffness by up to 20 percent
- Decrease blade thickness by up to 6 percent to increase aerodynamic efficiency
- Reduce total blade weight by up to 5 percent to ease the load on the turbine and tower, and enabling turbines to operate at lower wind speeds

For more about Ultrablade™ fabrics, contact christopher.skinner@owenscorning.com.

Uniconform® mat for advanced closed-mold processes

Designed for advanced closed-mold processes and initially launched in Europe, Uniconform® continuous filament mat is now available globally. Uniconform® mat is 100 percent Advantex® E-CR glass that is mechanically needled and contains no chemical binder, synthetic core or stitching yarns, delivering the following performance benefits:

- Reduces mold dressing time by as much as 50 percent for complex parts
- Increases tensile strength by up to 25 percent and flexural strength by up to 10 percent compared to standard conformable continuous filament mat
- Good finished-part surface appearance and resistance to water permeability
- Improved thermal stability and fire retardant properties; laminates can withstand temperatures up to 200°C with no permanent damage
- Unsurpassed clarity in translucent applications.

Videos demonstrating the benefits of Uniconform® mat are available at: http://www.owenscorning.com/composites/page/Uniconform.asp
For more about Uniconform® mat, contact marco.capelli@owenscorning.com.

Winners Announced 11 a.m. Feb. 3 In Booth 1417 at ACMA, Ft. Lauderdale

THE COMPOSITE APP CHALLENGE

The Composite App Challenge invited individuals and teams to submit applications and ideas in four categories intended to help resolve some of society's pressing issues – infrastructure durability, fuel efficiency, renewable energy and protection from harm. The finalists for each category are:

Infrastructure durability

Applications

- **Tony Carvalho**, Brazil, Impermeable Composite for Solvent
- **Tony Vanswijgenhoven** (business), Covess, Belgium, Thermoplastic Hot Water Storage Tank
- **Juergen Weigel** (business), Brazil, Continuous Winding Technology
- **Yuhe Yang** (business), U.S., Composite Bridge

Ideas

- **Leandro Henrique Grizzo** (Student), Brazil, Reforçamento de Compostos de PVC com Fibras de Vidro Longas para Aplicações na Construção Civil
- **Evgeniy Nikolaev** (business), Galen Ltd., Russia, Composite High-Pressure Pipeline

Fuel efficiency

Applications

- **Joe Carruthers** (team), United Kingdom, Lightweight Crashworthy Train Cab
- **Willem Louw** (business), Lomold (Pty) Ltd, South Africa, Composite Pallet Box

Ideas

- **Gauri Dutt Sharma**, India, Lighter Container
- **Philip Thicthener**, Australia, Carbon and Glass in Filament Winding

Renewable energy

Applications

- **Doug Selsam** (business), U.S., Superturbine® Rotor Blades
- **Claudio Mascialino** (business), Bluebasic GmbH, Austria, Vertical Wind Generator

Ideas

- **John Gangloff** (Student), U.S., Fuel Cells
- **Jaap Ketel**, Netherlands, Solar Kettle
- **Thomas Kloss**, U.S., Commercial Ducted Savonius Rotor VAT WEC
- **Philipp Schilcher** (Student), Austria, Increasing Efficiency in Concentrated Solar Power

Protection from harm

Applications

- (No finalists in this category)

Ideas

- (No finalists in this category)

For more about the Challenge, visit the competition website at: http://www.owenscorning.com/composites/page/appchallenge.asp

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