



MARKET

for composite solutions

SUMMER 2008

VISION

Cost
Pressure
Increasing

Material Costs Escalating

- Prices for precious metals used in bushings to form glass fibers have increased dramatically.
- Platinum averaged \$1,867 an ounce in the first quarter this year, a 43 percent increase over the same period last year.
- In the five-years beginning in 2003, rhodium averaged \$3,224.51 an ounce but climbed above \$9,000 an ounce in the first quarter this year.
- With their recent price increases, platinum and rhodium are now the largest cost component of glass fiber production.
- Energy-related costs are also increasing and are now 25 to 35 percent of the direct cost of producing glass fiber reinforcements.



Helping Customers Grow



Cem-FIL® AR Glass Reinforced Concrete Cladding Introduced



Window Lineal Developed with TWINTEX® Thermoplastic Reinforcement



INNOVATIONS FOR LIVING®

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EDITORIAL

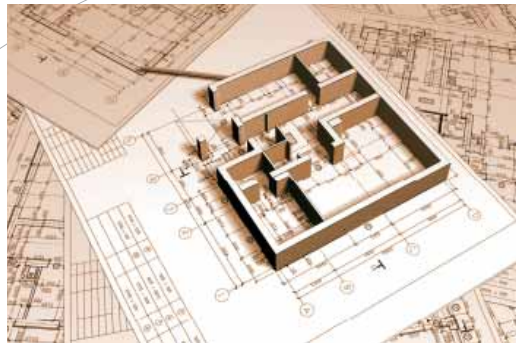
C O N T E N T S

CREATING A SUSTAINABLE ECONOMIC FUTURE



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Application Spotlight



We hear a lot about sustainability these days, and for many that means operating in ways that protect the environment for future generations. While that is a worthy objective, it falls short of the true definition of sustainability that includes three balanced outcomes – economic growth, environmental stewardship and social progress.

We have a lot of work to do in all three categories but the focus of this column is the need to transform the production and sale of glass fiber reinforcements into a sustainable, investment-grade business – a healthy business that can grow and in turn support your growth.

The composites industry is doing well in terms of demand growth. During the past 20 years or so composite use has grown at double-digit rates, steadily outpacing economic growth rates around the world. Most industries would love to have our long-term rate of growth.

The challenge we face is growing with an attractive rate of return. By attractive I mean robust enough to be a magnet for investment capital. Frankly, we are not there at the moment. In fact, the current rate of return is low enough to threaten the long-term growth of the industry. Current margins do not justify the investment needed to increase capacity in line with market growth.

An article on pages 4 and 5 of this issue reviews some of the economic pressures we are experiencing in the glass fiber reinforcements industry today. We are doing our best to offset these pressures with productivity programs that include new technology and innovations. We will appreciate your support as we work on this important industry issue.

Chuck Dana

Chuck Dana
President
Composite Solutions Business
Owens Corning

Glass Fiber Reinforcements Industry Experiencing Unprecedented Cost Pressure

A chart with a trend line climbing at a substantial rate is generally considered attractive. Any business person would love to have that chart reflect their company's sales or earnings growth. Unfortunately, it is a cost chart showing the rising price of platinum, one of the key materials used to make glass fiber reinforcements.

More expensive than gold, platinum averaged \$1,881 an ounce in the first quarter this year, a 58 percent increase over the average of \$1,192 an ounce in the same period last year. The trend continued in the second quarter as platinum was trading at more than \$2,000 an ounce as this magazine was being produced.

Another precious metal used to make glass fibers is rhodium. The story there is even more dramatic. In the five-year span beginning in 2003, rhodium averaged \$3,224.51 an ounce, but it climbed above \$9,000 an ounce in February this year.

Glass fiber manufacturers use platinum and rhodium to extend the life of the bushings that form the fibers. With their recent price increases, those two metals are now the largest cost component of glass fiber production.

With crude oil selling at more than \$130 a barrel as it was in mid-May, the cost of delivering products has increased. And as natural gas prices follow crude oil, the cost of melting batch materials to make glass also increases rapidly. Energy-related costs are now 25 to 35 percent of the direct cost of producing glass fiber reinforcements.

Source: * Johnson Matthey PLC - ** Bloomberg.com

Raw material costs – for items such as glass batch and sizing chemicals – have also risen sharply in recent years. Raw materials and related costs are 12 to 27 percent of the global cost of making glass fibers.

Glass fiber is lagging well behind other materials in terms of recouping these increased costs. A chart accompanying this article shows how the price of glass fiber reinforcements has lagged increases in other materials such as resin, steel, aluminum and wood. One result of this lag behind other materials is that glass fibers are now more competitive with traditional materials.

“For the long-term health of the business and to support market growth, we need to attract capital for investments in capacity,” says Arnaud Genis, Vice President and Managing Director, Europe, OCV Reinforcements, Global OCV Technical Fabrics and Specialties.

“We are doing everything we can internally to drive productivity improvements, reduce waste and reposition assets for greater efficiency,” continues Genis. “We are asking everyone to contribute to this effort and we are looking for new technology and innovations that can help.”

“We'll also need the support of our customers as we look for opportunities to make reinforcements an investment-grade business.”

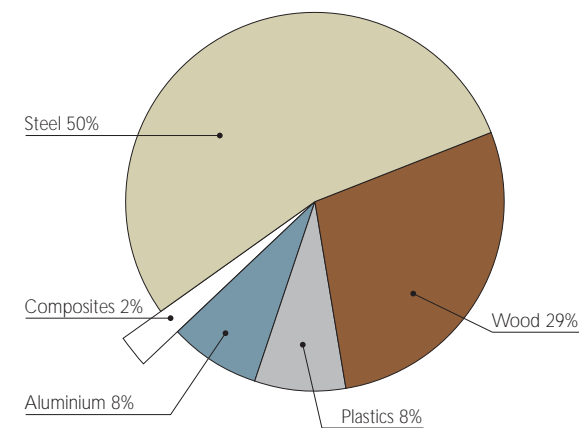
EXECUTIVE SUMMARY

- Pressure on margins due to cost inflation is making reinvestment decisions difficult to justify today.
- Rising costs of energy and precious metals have been biggest factors in driving down profitability.
- Productivity and waste reduction programs are not enough to offset the current rate of inflation.
- Markets are showing significant recovery, which is putting pressure on our ability to supply the market.

Great growth potential by replacing traditional materials with composites

Global material consumption split by volume, including all markets

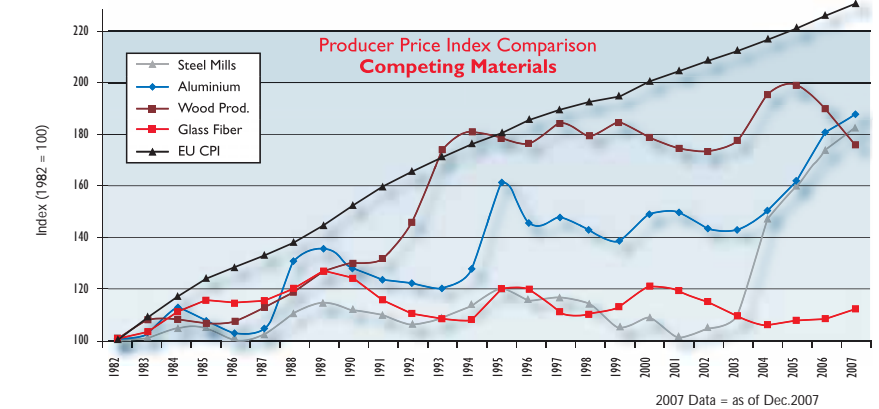
Source: Owens Corning 2005 Global Market Analysis



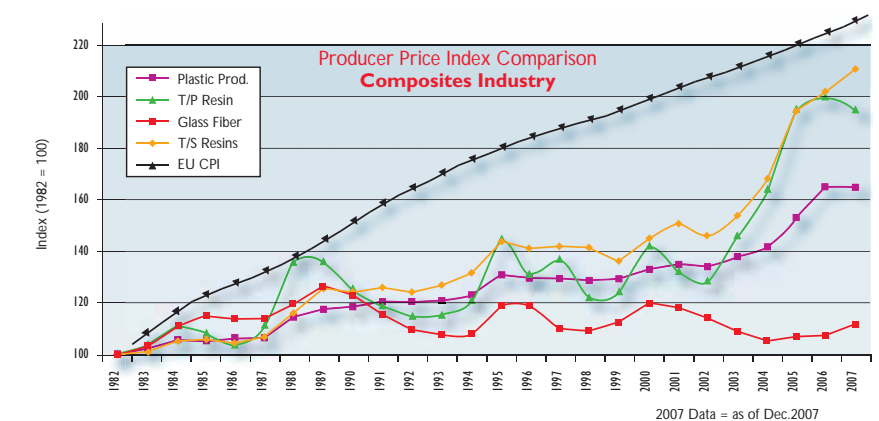
Material Pricing

The glass fiber industry has not been able to recoup increasing costs as other competing materials have in recent years.

Source: U.S. Bureau of Labor Statistics and Owens Corning



But this is also valid in the composites industry, where glass fiber is lagging well behind resin price in terms of adjustments to raw materials costs and inflation.



2007 Data = as of Dec. 2007

Helping Customers Grow

Growth managers in Composite Solutions are now doing just what the job title implies – helping customers grow their businesses.

“When we are successful,” explains Joe Arcadi, Customer Growth Manager for the Americas, “the customers we help growing their businesses need more composite products to do so. The number one request I get from customers is ‘Please help me grow my business.’ We have listened and are taking action.”

Arcadi says he isn't alone in his job because he works directly with the sales teams in their regions. “I give the sales teams more tools to use to help their customers,” explains Arcadi. “Together, we deliver more value.” Our approach to marketing is centered around incremental growth with and through our customers.

How do they help customers? Arcadi cites his work with Enpress, LLC as a case in point and is one example of initiatives ongoing globally.

“Enpress is an innovative company with a clearly superior product,” he says. “Their composite pressure vessels incorporate technology that makes them better than competitive products, but they needed help

getting the word out to consumers and the distribution network about their product's value.”

Arcadi says the company is relatively small with fewer than 50 employees and doesn't have the budget for a big advertising campaign. So he introduced them to a marketing firm he knew would be good at finding innovative yet low-cost ways to achieve their objectives.

After gaining an understanding of the company and its products, the agency developed a series of educational articles and worked with key market magazines to get them published. After the articles were published and their phone started ringing in response, Enpress increased its production forecast for the year by 30 percent.

“A couple of our customers doubled their orders for this year,” says Michael Mormino, Vice President of Sales and Marketing at Enpress.

Before Arcadi and the agency communicated the added value of Enpress technology, Mormino says the market was focused on making price-driven decisions. Now, he believes there is a broader understanding of the added value in Enpress products and systems.

Mormino says Arcadi brings his company an industry perspective through his work with other businesses. “Putting us in touch with the agency helped us think outside the box and come up with different ways to communicate our messages,” he says.

“The agency also encouraged us to highlight the environmental benefits of our water-saving technology,” continues Mormino. “This should continue to pull our products through the marketplace as the green movement gathers momentum.”

Arcadi can be reached at 1.440.286.5777.

ENPRESS TECHNOLOGY

Only a five-year-old company, Enpress, LLC is already a leading manufacturer of high-performance composite pressure vessels for water treatment systems.

Located in Eastlake, Ohio near Cleveland, the company sells its filament-wound tanks around the world. An innovation that sets the company apart is its Vortech™ bottom plate technology – an advanced, water conditioning and filtration solution.

The Vortech system creates even water distribution during both service and regeneration by covering the lower circumference of the tank. Compared to standard basket distributors in which the flow tends to be non uniform and concentrated around the basket, the Vortech bed is completely fluidized at much lower flow rates. According to Enpress, a family of four can reduce its water use for regeneration as much as 214 gallons a month.

For more information about Enpress technology, visit www.enpress.com, or call 1.866.859.9274.



Resource Center

High-Performance Reinforcements

A new brochure and website about high-performance reinforcements are available from OCV™ Reinforcements.

Building on its heritage of leadership and innovation in glass fiber reinforcement and composite technology, Owens Corning introduced a new generation of high performance glass reinforcements in 2006. The new high-strength platform provides the nucleus for a portfolio of products tailored for specific end-use markets.

The four product brand names and markets they serve are: WindStrand™, wind energy; ShieldStrand™, ballistic armor; FliteStrand™, aerospace; and XStrand™, commercial, industrial, sports and recreation.

“Owens Corning invented S-2 glass fibers in the late 1950s and early '60s and we advanced that technology with the introduction of the new generation of high-performance glass reinforcements,” explains Wisdom Dzotsi, Marketing Leader, Americas, OCV Reinforcements.

The new website is a comprehensive resource for the platform and four brands, including technical data, videos and other useful information.

A PDF version of the brochure can be downloaded at: www.ocvreinforcements.com/hp/techinfo.aspx

The website is available at: www.ocvreinforcements.com/hp



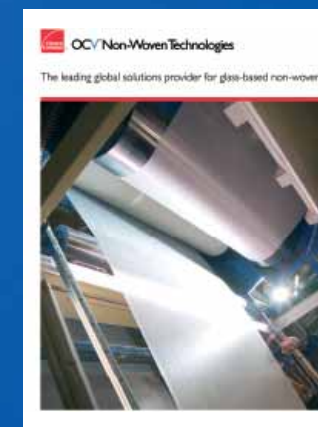
Non-Woven Technologies

A brochure is now available from OCV™ Non-Woven Technologies that serves as an introduction to its products.

OCV Non-Woven Technologies is an innovator in the fabrication of a wide variety of veils and specialty non-woven materials. Made from randomly dispersed Advantex® glass fibers, wet laid and bonded into a thin sheet, these materials are used to reinforce products that include residential and commercial flooring, carpet tiles and gypsum boards, as well as exterior-use materials.

For a printed copy, send your name and address to:

NonWovenInfo@owenscorning.com



Wind Energy

Two Owens Corning leaders have collaborated to write an article in the wind energy market for issue number 40 of JEC Composites Magazine (May 2008).

Claude van Hoornweder, Global Wind Energy Manager, OCV Technical Fabrics, and Wisdom Dzotsi, Marketing Leader, Americas, OCV Reinforcements, are the authors of the article, which is titled “Dual focus needed for wind energy.”

“The goal for wind blade fabricators today is reliable quality and delivery to maintain trust because their customers are committing to very big contracts and need suppliers who will help them make good on their commitments,” wrote van Hoornweder and Dzotsi. “The challenge for suppliers is to support this need while also working on longer-term projects that can transform and grow the market.”

To access the article, go to: www.jeccomposites.com/magazine/



Building Opportunity in the Global Construction Market

Listening to talk about the global construction market is a little like hearing six blind men describe an elephant, each of them having touched a different part of the animal. In that classic story, of course, the men compare notes and find they have very different perceptions of the same reality.

In the U.S. today, sales of tubs, showers and sinks for residential construction are down substantially from the recent past as new-home starts and sales have dropped to their lowest levels since 1991. People serving the residential construction market there describe the economy in rather bleak terms.

At the same time, the non-residential construction market in the U.S. is growing overall. There is lots of activity in energy and minerals, and the corrosion resistance of composite materials is needed in those segments of the market. Pultruded profiles, composite grating and pipe for mining and petroleum refining are selling briskly.

The situation is not as extreme and generally more upbeat in the rest of the world. Positive economic growth in Europe and Asia is supporting traditional applications in those regions and composites are winning more materials battles in construction. A key driver is the high cost and availability of steel, especially corrosion-resistant alloys and coated products.

"Composites are now able to go head-to-head with steel on a cost-per-part basis," says Matt Lieser, Global Market Intelligence Leader. "And when engineers understand the other benefits of composites – such as durability and lighter weight – composites are being picked for more applications."

Competing well with stainless steel

"We're competing well with stainless steel," says Mike Beaupre, Vice President of Operations at Bedford Reinforced Plastics in Bedford, Pa., U.S. "A lot of food processing plants are using composites around food and water. It's a good material price-wise against stainless because nickel prices (for alloys) have gone through the roof."

One characteristic of the construction market that sets it apart from some others is the many applications and potential specifiers. It is not like the automotive industry, for example, where a handful of key decision-makers at a few large companies determine materials use.

"We need to continue educating engineers and designers in construction," says Lieser. "To be successful in the non-residential construction market, a company needs to pursue leads and win major projects. That means reaching out and communicating with project decision-makers."

OCV™ Reinforcements helps with this by finding projects and funneling the leads to customers. The company is even partnering with other materials suppliers – such as a resin producer – to find and pursue leads.

"OCV Reinforcements is bringing in the leads and telling us about projects that are out there," says Bedford's Beaupre. "They are helping us to work those leads, too, to track them down and find out when the projects are going to be cut and what the materials are. They get us in on the front end."

Education is key

Beaupre agrees that education is a key to future market growth.

"We're working right now with others on standards for pultruded fiberglass," he says. "Once the standards are in place, universities will start teaching engineering students how to design with this material. Right now that doesn't exist at most schools but it is coming."

"When that begins and engineers start graduating and there are actually textbooks and standards they can take off the shelf to use, then I think they're going to start using this material (composites) and it's really going to take off. So there's an exciting future for the industry and everyone that's in it."

Lieser says the current prices of steel and oil have even prompted some fabricators to revisit potential new applications that were judged economically unfeasible only a few years ago.

"The current economic situation has tipped the playing field," explains Lieser. "There are now more opportunities than ever before in the construction market."

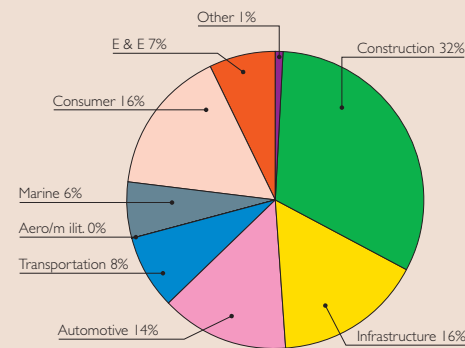
Composite fabricators have already found significant business opportunities in the construction market. Following are highlights from several of them.

Regional comparison of construction market in 2007

(Source: Owens Corning)

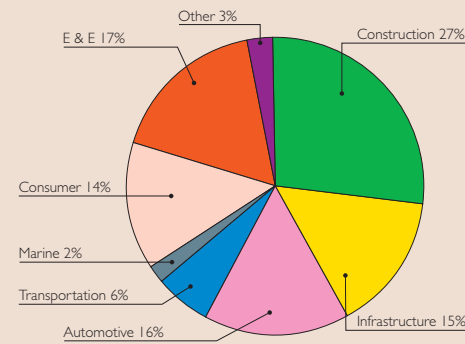
EUROPE

0.88 Kgs per capita of glass fiber



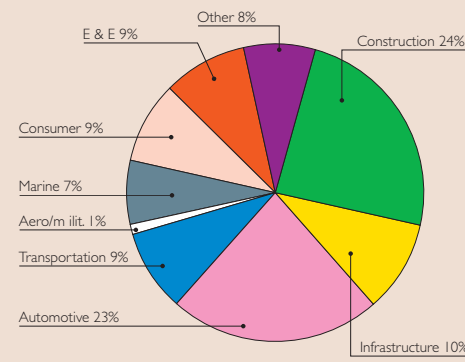
ASIA

0.32 Kgs per capita of glass fiber



AMERICAS

1.41 Kgs per capita of glass fiber



Reinforced Concrete Cladding Introduced

Although alkali-resistant glass reinforcements were introduced more than 10 years ago, fabricators continue to find new applications for the product in the construction market. One example was recently introduced by Austria-based pre-fabricated concrete manufacturer Rieder Smart Elements GmbH.

Rieder has manufactured pre-fabricated concrete components for almost 50 years but the company only began its own research into GRC products in 2002. Wolfgang Rieder joined the family-owned business in 2003 and one year later had developed and introduced a revolutionary product – fibreC® panels.

"FibreC panels are glass fiber reinforced concrete cladding that combines the advantages of concrete and Cem-FIL® alkali-resistant glass fibers," says Rieder CEO Wolfgang Rieder. "The panels are as solid and durable as concrete but are also thin-walled, lightweight and have increased fire resistance. This allows the building or renovation of facades with perfect reproduction of complex details and fine texture, as well as the molding of elaborate shapes."

Alkali-resistant (AR) glass fibers are designed for the reinforcement of concrete and cement and are a superior alternative to materials traditionally used such as polypropylene and steel fibers. With tensile strength three to four times greater than steel and modulus 10 times higher than that of polypropylene, AR glass fibers give better physical and mechanical performance, with flexibility that enables thinner wall sections to be achieved to bring new possibilities to the shaping of concrete. With only a 5 percent addition of AR fibers it's possible to obtain a very light, extremely thin moldable composite material.

AR glass has the same density as cement and therefore it does not float or sink, providing for excellent dispersion in the matrix. It does not corrode and is fire resistant, as well as resistant to the acids and alkalis present in concrete. AR glass also resists degradation by UV light and temperature variations, making it suitable for outdoor applications in all environments.

Rieder says GRC panel cladding can be easily removed from building facades and replaced while the old panels, after grinding, are recyclable with up to 15 percent regrind utilized for the fabrication of new GRC panels while 100 percent regrind can be added to concrete mixes.



Building Opportunity in the Global Construction Market



Window Lineal Developed with Thermoplastic Reinforcement

OCV™ Reinforcements and Bouvet et Lorillard cpy in France have developed a reinforced thermoplastic window lineal. Technical work has been completed and the teams are now transferring the development to industrial processes. Commercial availability is expected this fall.

The project started when Bouvet et Lorillard expressed a desire to eliminate steel reinforcement from its line of polyvinyl chloride (PVC) windows. In addition to concerns about the cost and availability of steel, engineers there were looking for a way to retain the

insulating properties of the PVC, which were compromised by the presence of steel in the product, and avoid the need for a two-step process that extruded a shaped profile and then inserted the steel reinforcement.

From the perspective of OCV Reinforcements, the application seemed like a good opportunity for TWINTEX® reinforcements, except that the product's standard polypropylene matrix is not a good match for PVC. The solution – develop a TWINTEX product with a PVC-compatible matrix.

After overcoming several technical challenges and running many tests at both OCV Reinforcements and Bouvet et Lorillard, a suitable thermoplastic reinforcement product was developed. The new TWINTEX product has a PET (polyethylene terephthalate) matrix that works well in the forming equipment at Bouvet et Lorillard.

The glass-reinforced profiles are strong enough to not need additional reinforcement and they are more thermally efficient than lineals previously reinforced with steel. The lineals also have other properties and capabilities of thermoplastics, such as their post-forming potential for shaping, texturizing and weldability. Bouvet et Lorillard markets the profiles as incorporating Twinea® Technology.

And while it makes mostly white profiles, Twinea Technology is also “green.” Windows made with the technology reduce energy use compared to windows having profiles with steel reinforcement. Thinner profiles provide a larger window opening, allowing the benefits of natural light. The PVC is made without lead, profile waste is milled and re-used for the extrusion of non-decorative profiles, and Twinea profiles are marked to help identify them for a specialized recycling process after their useful life.

Once the new reinforced thermoplastic window lineals are in commercial production, the OCV Reinforcements team will be looking for opportunities to enhance other products made with PVC.

Police on a Pedestal

One of the newest applications of composite materials in the construction market is also one of the more unusual. For the Brazilian capital of Brasilia, MVC has developed a modular police office that includes a six-meter-high tower for visual patrolling by officers or with a camera system.

“The police offices are part of a bold plan to improve security in the many neighborhoods of the city,” says MVC General Director Gilmar Lima. “Better security will help improve quality of life and social equality.”

Lima expects to deliver 300 modules through 2009, consisting of a 24-square-meter office and a six-meter tower for visual patrolling. The offices will be equipped with telephones, computers, bathroom and kitchen, sheltering up to 16 police officers.

“The product was developed in only four months,” continues Lima. “That time includes the production of a prototype for approval and public presentation.”

The offices are made with a metal structure, an external finish made with integrated RTM (resin transfer molding), contain a structural nucleus in polyurethane injection (PU), internal coverings with MVC Wall System panels and doors and facades formed for tempered glass. The observation tower is produced with hand lay-up.

The MVC Wall System includes a composites skin (polyester resin with multi-end roving from OCV™ Reinforcements) and a core of expanded polystyrene foam (EPS) insulation, made in

a process similar to continuous lamination. The application also uses molding mat and chopped strand mat from OCV Reinforcements.

The system has excellent thermal and acoustic insulation qualities, which is important for use in Brasilia where the climate is hot and dry. The walls also provide high mechanical toughness, easy cleaning and low-cost maintenance – all basic requirements for government projects.

Lima says he is encouraged by the reception to the new composite police offices.

“For the Brazilian civil construction market, solutions with new technology face great difficulties due to the strong traditional culture of existing systems,” he explains. “Acceptance of the composite police offices indicates a clear trend with a promising future for composites. I believe we are beginning to overcome the lack of knowledge about the performance and benefits of composite materials.”

Owned by Marcopolo S.A., MVC was founded in 1989, in São José dos Pinhais, Brazil. Starting with vacuum forming, light RTM, continuous lamination and PU, MVC focused on the automotive industry and then gradually broadened its operations to the light industry and infrastructure markets. Recently, MVC developed exclusive wall system technology that is focused on the construction market. The company has four manufacturing plants: three in Brazil (São José dos Pinhais, Catalão and Caxias do Sul) and one (Poloplast) in Monterey, Mexico.



Construction applications

that capitalize on the properties of composite materials include:

Cooling towers in heat generating plants

Facade cladding that is strong and weather resistant

Floor coverings including laminated products and the backing for carpet tile

Grating in chemical plants and other corrosive environments

Gypsum board that prevents mold and moisture concerns and allows buildings to be enclosed sooner without the final exterior

Piers and pilings for waterfront use where impact and corrosion-resistance are needed

Pipe to move corrosive byproducts in mining, and for refineries

Pollution control systems in manufacturing plants

Rebar for concrete construction

Roofing shingles that do not absorb moisture

Sinks and countertops that provide a solid surface with the look of marble, granite and onyx

Snap-ties for concrete framework

Structural profiles in a variety of shapes ranging from angled and u-shaped channel to bars, I-beams, tubes and rods

Tanks for highly corrosive chemicals and other materials

Tubs and showers that are lightweight and durable, and eliminate the need for regular caulking

Wall panels for hospitals, food service facilities and other commercial settings that are durable, non-absorbent and easily cleaned; also for rooms where corrosive materials are used

Window frames that are strong and won't warp or absorb moisture

Doing Well and Driving Value

"The expanded Owens Corning Composite Solutions Business is doing well and is driving value for its customers."

That was the message from CSB President Chuck Dana as he met with customers and media representatives during the JEC Composites trade show in Paris in early April.

Dana's remarks were reinforced a month later when Owens Corning announced financial results for the first quarter and the composites business was one of the bright spots in the report. First quarter sales increased year-over-year as a result of the acquisition of Saint-Gobain's reinforcements and composite fabrics businesses in November 2007. Unfortunately, that sales increase was offset by weaker demand for the company's building materials associated with the continued downturn of the U.S. housing market.

"Our acquisition of Saint-Gobain's reinforcements and composite fabrics businesses is paying off, delivering sales growth outside the U.S.," said Mike Thaman, Chairman and Chief Executive Officer. "We are very pleased with the performance of this segment."

The company said global demand for glass fiber reinforcement products grew during the first quarter, leading to higher capacity utilization and improved productivity.

Expanding capacity for roving

On April 21, Owens Corning announced plans to further invest in the composite materials industry by expanding glass fiber reinforcement capacity at its Amarillo, Texas, U.S. facility in 2008. The expansion will increase the company's ability to meet

market demand in North America for Advantex® single-end roving.

"Our OCV™ Reinforcements division is investing in the future of the North American composites industry so that we can meet the growing market demand for glass fiber reinforcement products," said Dana. "This expansion will ensure the local supply of single-end roving for our customers in the Americas, while improving manufacturing productivity."

The expansion at Amarillo will increase the plant's capacity to produce single-end roving by about 40 percent.

Installing capacity for high-performance reinforcements

As part of the agreement that helped form of OCV Reinforcements, the European Commission required Owens Corning to divest itself of two European plants, one of which manufactured the company's high-performance glass reinforcements.

The company retained the right to produce high-performance reinforcements using the technology and moved quickly to install production capacity for high-performance reinforcements at the company's plant in Mexico City.

"The team has done a fantastic job expediting the start-up of the operation and we plan to light the glass-melting furnace for that line on June 18," says Wisdom Dzotsi, Marketing Leader, Americas. "We expect to begin shipping product in early August."

Dzotsi says the Mexico City facility is a great choice for installing all of the technology that is an integral part of producing high-performance reinforcements.



"The technology package includes the advanced glass melting, fiberizing and binder chemistry that ensures consistent high quality and sufficient volume.

"The new facility represents a breakthrough in large scale production of high-performance glass fibers for demanding high performance applications like aerospace, military and wind energy," he adds. This will bring about a market transformation as the value of this innovative technology enables engineers to realize projects that have not been economically feasible.

"Our ability to rapidly modify our operations and begin production of these products is an example of how OCV Reinforcements has the necessary global flexibility and commitment to responsiveness to serve customer needs."

OCV Technical Fabrics Changing for the Better

"Customers ask me if things are changing as a result of Saint-Gobain Vetrotex joining forces with Owens Corning," says Mark Revill, Global Sales and Marketing Director, OCV Technical Fabrics.

"The fact of the matter is, things are changing and they are changing for the better," he continues.

"Owens Corning acquired the Saint-Gobain reinforcements and technical fabrics businesses because Owens Corning is committed to the composites industry and intends to remain the market leader for our customers," he continued. "The company acquired a strong supplier to the composites industry and the combination will only make the teams stronger."

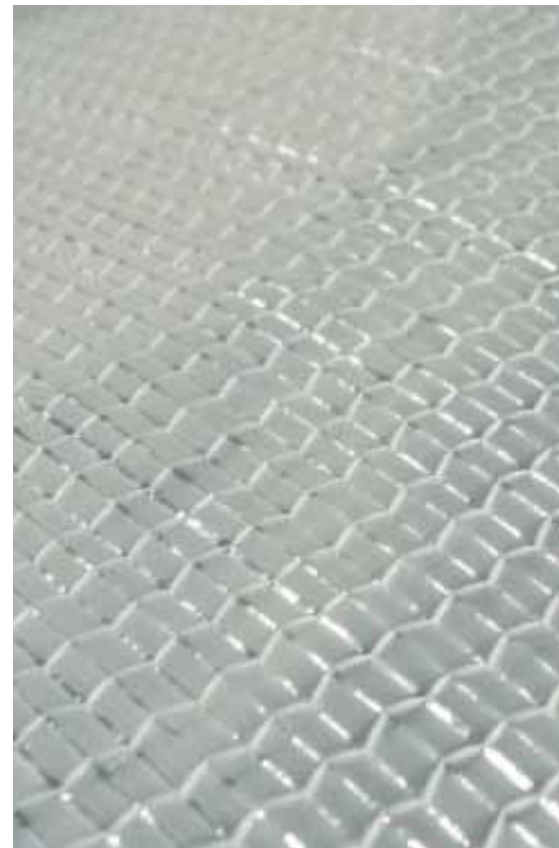
"One of our strengths in fabrics is certainly our presence around the world and vertical integration with the glass reinforcements

business. Other combined strengths include technology, responsiveness, investment capital and focus on market growth. The business is clearly better than it was before."

Revill says the recently announced plan to close two U.S. fabrics facilities (Ridgeway, S.C. and New Braunfels, Texas) is an example of change that will make the business stronger.

"Most operations will be shifted to the composite fabrics facilities in Brunswick, Maine, and Wichita Falls, Texas," says Revill. "We expect to have the consolidation completed by mid-year 2008 and this will allow us to focus our investments and continue to have world-class facilities."

"OCV Technical Fabrics is a key part of the company's plans for future growth," added Revill. "Owens Corning made a substantial investment in the business and sees it as a strategic acquisition."



Panning for Gold in the Value Stream

How can Composite Solutions help their customers get more out of the value stream? That's a big question with many answers but one of them is certainly working together on waste elimination through continuous improvement programs.

One prime example can be found in Asia Pacific where an "Adopt a Customer" program has the manufacturing facilities paired up with customers to work through Kaizen continuous improvement events to improve quality and customer satisfaction.

Another example is in the Americas where a pilot program is analyzing an e-supply chain

system that eliminates traditional purchase orders and replenishes the customer's inventory based on use and demand. The system reduces schedule variations for operating production lines, requires less inventory and improves responsiveness.

According to Jon Hartman, Director of Global Continuous Improvement and Quality for Composite Solutions, these initiatives and others are intended to build strong working partnerships with customers and enable them to get more value out of their businesses.

"We take waste elimination very seriously at Owens Corning," says Hartman. "It is one of three core stands, which means it is a key part of our strategy and gets a lot of attention and focus within the company. Using such processes as Kaizen, LEAN and Six Sigma, we are making waste elimination part of our DNA."

Hartman says sharing its continuous improvement experience with customers and working on joint projects is part of the value Owens Corning brings to the marketplace.

Kaizen

Six Sigma

LEAN



Application Spotlight

New Application for

XStrand™ High-Performance Reinforcements

What could be a more appropriate application for XStrand™ high-performance reinforcements than pressure cylinders for X Ball and other highly competitive paintball games?

That must have been what engineers at Inocom, Inc. were thinking when they selected XStrand high-performance reinforcements for pressure cylinders in the paintball market. Rated up to 5,000 psi, the cylinders hold the compressed carbon dioxide or air that propels paint-filled, breakable, gelatin paintballs shot from a "paintball marker."

Inocom specializes in the production of composite high-pressure cylinders and has developed expertise in design, analysis and manufacturing. Their composite tanks are lightweight aluminum lined and wrapped with filament-wound fiberglass and carbon, resulting in products up to 50 percent lighter than all-aluminum cylinders. Paintball cylinders are also shortened to minimize body exposure during the game.

According to Dr. Tae-wook Kim, Vice President, Inocom selected XStrand reinforcements because the product has a very good ratio of performance to cost. Kim also noted that the product has very low standard deviation of physical and mechanical properties, as well as the good surface and color that end-users prefer.

"OCV™ Reinforcements is a leader in the global composite market," added Kim. "The company's brand and good reputation, good quality and reliability can help us get global certification for our products and also provide assurances about the reliability of our cylinders to end-users."

Founded in 2003 as a sister business of Samwoo Enterprise Company, Inocom is headquartered in Daegu, Korea. Through their advanced technology, Inocom quickly became the fastest growing Type 3 high-pressure cylinder maker in Korea and caught up with the global leaders of high pressure cylinders in terms of quality and price. The company has the capacity to make more than 150,000 tanks per year that meet DOT (U.S.), TC (Canada) and PI (Europe) standards.

Inocom's use of XStrand reinforcements started with the paintball cylinders and they already plan to extend the process into medical tanks. The company also makes cylinders for self-contained breathing apparatus (SCBA), fuel cell vehicles (FCV), compressed natural gas (CNG) and aviation.



Application Spotlight

Mega Sports Vertriebs Develops Reinforced Thermoplastic Canoe



German sport and leisure boat builder Mega Sports Vertriebs has developed a composite canoe made with reinforced thermoplastics.

The innovative Robson Brook-16 composite canoe uses TWINTEX® technical fabric from OCV™ Reinforcements in a low-investment vacuum bag molding process that produces a light weight, high stiffness, abrasion- and impact-resistant structure that was not subject to part-shrinkage during processing.

A significant environmental advantage of utilizing

thermoplastic composites and vacuum bag closed molding technology is that no emissions are produced during the curing process. Moreover, the material can be recycled at end-of-life when it can be shredded and, in a 50/50 mix with virgin resin, be reused for injection molding automotive parts and other applications.

TWINTEX®, a commingled product based on reinforcement glass fibers and thermoplastic filaments such as PE, PP, PET or PBT is available as roving, sheets, pellets and fabrics. The commingling technology also allows a high glass content

of up to 80 percent to be achieved, thereby providing for exceptionally strong and lightweight parts while still retaining an even surface finish.

The combination of TWINTEX® fabric and vacuum bag molding enables the production of low volume, large thermoplastic composite parts able to meet high mechanical performance and long-life criteria, as well as delivering consistent part quality. This makes it ideal for sport and leisure, niche automotive and marine applications for which high quality is demanded in short production-run parts.

"We chose TWINTEX® thermoplastic composite because it met all the criteria we set for the new canoe," says Karl Fischer, Co-owner of Mega Sports Vertriebs. "The material gave a technical look similar to that of carbon with its fusion of performance, style and color. Its weight is almost the same as an ABS sandwich construction but 30 percent lighter than canoes molded in PE. The material's high stiffness and impact and abrasion resistance were also important to prevent damage during transportation and use."

Study Shows Potential for GRC Columns and Beams

At the Glass Fibre Reinforced Concrete Association Congress in Prague this year, Maria José Alvarez Casariego, Global Technical Manager for Alkali-Resistant Glass, OCV Reinforcements, presented results of a study showing the potential for filament-wound glass fiber-reinforced cylinders to strengthen pre-cast concrete columns and beams.

"It has been demonstrated that confining concrete in a highly resistant jacket will improve its mechanical performance," said Alvarez Casariego. "The remaining problem is how to jacket the concrete in an effective and economical way."

Alvarez Casariego said OCV Reinforcements has been working with the Composite Materials Technology company for several years to improve the winding of glass fiber-reinforced concrete (GRC). Using alkali resistant (AR) Cem-FIL roving

and a special matrix, cylindrical poles of high-strength GRC are being produced in U.S.

"These poles are probably the best solution for power distribution," she explains. "Substituting for steel, unreinforced concrete or wood, the glass-reinforced concrete poles offer the most resistance against natural catastrophes like earthquakes or hurricanes."

After demonstrating the flexural strength of the glass-reinforced concrete power poles, Alvarez Casariego and others started thinking about the possibility of using poles as a permanent formwork for columns. It was an attractive idea but the performance had to be measured.

For that purpose, poles with a length of 2.12 meters were tested. The poles were first fabricated and cut to length,

then filled with concrete and cured for 28 days in a climatic chamber. Compressive strength was measured using a hydraulic press.

As expected, the best performances were obtained using 2 x 90° layer (almost three times more resistant than plain concrete).

"Based on these results, filament-wound poles could be used as structurally participating permanent formwork and reduce the needed diameter of a column," said Alvarez Casariego. A more extensive study is now needed to characterize this solution."

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