

GOING GREEN

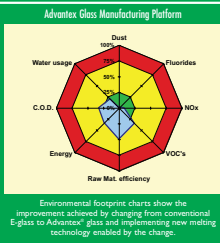
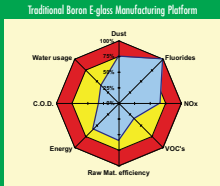
## STEWARDSHIP GROWS IN COMPOSITES

The composites industry is "going green!" Here are a few examples of how Owens Corning and the composites industry are practicing environmental stewardship:

• Owens Corning made a key decision early in the development of its new high performance reinforcement platform trademarked HiPentex™ – the new family of products will not be made with boron or fluorine.

• Wind energy is already at the leading edge of the environmental movement and HiPentex reinforcements will soon enable the industry to take another step forward by reducing the cost per kilowatt-hour.

• The composition of Advantex® glass allows the use of advanced melting technology. The results are dramatic reductions in Nitrogen Oxides (NOx) emissions as well as increased energy efficiency and reduced CO<sub>2</sub> emissions.



• In the aging sewer systems of such diverse countries as India and Sweden, municipal governments are protecting the environment by installing corrosion-resistant and long-lasting composite liners made with Advantex glass.

According to Ashish Diwani, Vice President of Innovation for the Composite Solutions Business, protecting the environment is more than a goal at Owens Corning – it is a keystone of the company's corporate philosophy of responsibility.

"The company's commitment to the environment involves the production of the high-quality, long-lasting products while taking measures to conserve natural resources and minimize the environmental impact associated with manufacturing," explains Diwani.



# COMPOSITE SOLUTIONS

Vol. I, No. 3 – 2006

## OWENS CORNING, SAINT-GOBAIN INTEND TO MERGE REINFORCEMENTS BUSINESSES

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### COMPOSITE SOLUTIONS

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### COME SEE US

The Owens Corning Composite Solutions Business will be at the following trade shows:

- **China Composites**, September 4-6, Shanghai, China
- **Composites & Polymers 2006 (ACMA)**, October 18-20, St. Louis, Mo.
- **Feipar Composites & Feipar**, November 7-9, São Paulo, Brazil



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The use of composite pipe and structures is growing on oil platforms to reduce topside weight and resist corrosion.

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## A MESSAGE FROM CHUCK DANA

PRESIDENT, COMPOSITE SOLUTIONS BUSINESS, OWENS CORNING



So much has happened since the last edition of this magazine I hardly know where to begin. Let's start with the big news that Owens Corning and Saint-Gobain are in discussions to merge the Owens Corning Reinforcements Business and the Saint-Gobain Reinforcements and Composites Businesses. This merger will bring together two pioneers in the industry, each with long histories of product innovation and customer focus.

Like composites themselves, the combined enterprise will be stronger and able to do much more than either business could alone. There are obvious benefits for the customers of both businesses, such as the expanded global manufacturing, distribution and service presence, and the accelerated pace and synergies we expect from a combined technology team. Even more exciting for me is our strengthened ability to work with you to develop new applications that replace aluminum, steel and wood, so together we can grow glass reinforcements' share beyond its current 1 percent of the materials market. The bottom line is that Owens Corning-Vetrotex Reinforcements will participate more effectively and be a better supplier in today's increasingly competitive marketplace.

The transaction is anticipated to close in early 2007. In the meantime, Owens Corning and Saint-Gobain Vetrotex will continue to operate separately.

In early May, we completed our purchase of the composites business of Asahi Fiber Glass Co., Ltd. in Japan. The addition of manufacturing capacity there allows us to deliver more value to you and other customers around the world. Also, the products and technology acquired there will support your business by enabling us to deliver a broader range of composite solutions in several markets.

Also in early May, Owens Corning announced that it has reached an agreement with its key creditors on a Plan of Reorganization that paves the way for the company to exit Chapter 11 in 2006. This important milestone should enhance your confidence in our financial strength and future.

Before closing, I want you to know that the new high performance reinforcements platform we announced in late February – trademarked HiPerTex™ – is rapidly becoming well known in several end-use markets. We have had an unprecedented number of inquiries. Potential customers are qualifying the product and the tests are going well. We are on track to have the product available on schedule in the fourth quarter. This new reinforcement platform is a great example of how we intend to use technology and innovation to enable new and better applications. The intended result is continued growth for the composites industry.

As always, we welcome your feedback.

Sincerely,



## GLOBAL NEWS ROUNDUP

### OWENS CORNING, SAINT-GOBAIN ANNOUNCE INTENT TO MERGE REINFORCEMENTS BUSINESSES

Owens Corning and Saint-Gobain jointly announced discussions to merge the Owens Corning Reinforcements Business and the Saint-Gobain Reinforcement and Composites Businesses – known as Vetrotex – into a new company, to be called Owens Corning-Vetrotex Reinforcements.

The partnership of these two businesses would establish a global company in reinforcements and composite fabrics with worldwide revenues of approximately \$1.8 billion (euro 1.5 billion) and 10,000 employees. The new company would have operations across Europe, North and South America, and Asia, including key emerging markets: China, India, Russia, Mexico and Brazil.

The Saint-Gobain Textile Solutions business, serving mainly construction markets, will remain part of that company's High Performance Materials Sector. The Owens Corning Veil Technologies and Falwel businesses will remain part of the Owens Corning Composite Solutions Business.

"This is an exciting opportunity for Owens Corning, our customers and our employees," said Dave Brown, President and Chief Executive Officer of Owens Corning. "It demonstrates our commitment to the composites business and our customers on every continent. We plan to combine the best of both companies, grow with our customers and deliver strong operating results."

While the companies have not yet reached a definitive agreement, it is anticipated the transaction would be structured as a joint venture with Owens Corning owning a 60 percent equity interest and Saint-Gobain owning the remaining 40 percent. After a minimum of four years, joint venture provisions would give an option to Saint-Gobain to sell its 40 percent stake to Owens Corning.

### CEREMONIES MARK COMPLETION OF ACQUISITION IN JAPAN

Integration celebrations held in Tokyo and Ibaraki, Japan marked the completion of the company's acquisition there.

Announced in December 2005, the deal officially closed on May 1, 2006. The acquisition included the composites business of Asahi Fiber Glass Co., Ltd., including a factory in Ibaraki, about one hour from the heart of Tokyo.

The acquisition expands the Owens Corning product portfolio to include:

- Reinforcements for high-performance thermoplastics such as Liquid Crystalline Polymer (LCP), Polyphenylene Sulfide (PPS) and Polyphenylene Oxide (PPO) polymer products.
- Long-fiber thermoplastic compounds for Asia Pacific.
- Sheet Molding Compounds for the Japanese market, including high-heat industrial and Class A applications for automotive and consumer markets.
- Rubber-coated glass-fiber solutions used in engine timing belts for the automotive industry.

Key patents, product formulas and innovative technologies were an instrumental part of the acquisition. "This brings greater value to our customers around the world through enhanced customer relationships, technical capabilities and innovations," said Gary Nieman, Vice President and Managing Director of Composites Asia Pacific.

### AIKEN MAT LINE DEDICATED

At the end of May, Owens Corning held a dedication ceremony in Aiken, S.C., to celebrate the completion and start-up of a third production line there. The \$25 million expansion makes coated glass fiber mat to support a customer's composite solution that is transforming the building materials industry. The line produces an innovative Owens Corning glass mat facing for a customer's paperless interior wallboard product that offers moisture and mold resistance.

### MORE KNITTING CAPACITY IN BRAZIL

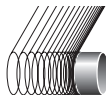
At JEC Composites 2006 in Paris, Owens Corning announced the addition of a new glass fiber knitting line at its facility north of São Paulo in Brazil. The news followed other major Owens Corning announcements for the wind energy market including a capital investment in India to support the country's growing wind energy demand.

### HAQUE NAMED SPE FELLOW

Enamul Haque, Science and Technology Leader for Owens Corning Automotive Solutions, has been named a Fellow by the Society of Plastics Engineers (SPE). Haque received the honor for his contributions to the composites industry.

"I feel like it is a great honor to be recognized," said Haque.

"There are five other SPE fellows in composites – all professors who have published papers on various topics. Industry leaders don't usually get this award."



INNOVATIVE TECHNOLOGY

## EARLY APPLICATION STILL GROWING COMPOSITE MATERIALS CONTINUE TO FIGHT CORROSION IN OIL FIELDS

While many businesses and consumers have been hurt by the rising prices of oil and steel, Al Mack at Western Fiberglass Sales in Red Deer, Alberta, Canada, feels a different kind of pain.

"We're busy," he says. "The price of oil gets up and everybody's in a hurry." Add volatile and rising steel prices to the mix and Mack gets even busier.

"Right now, fiberglass pipe is about the same price as bare steel. Internally coated steel pipe is actually more expensive than fiberglass pipe now.

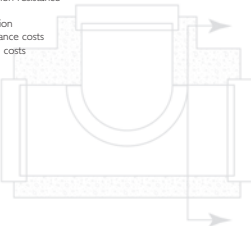
"Steel is also hard to get," continues Mack, who gets his glass-reinforced polymer (GRP) pipe from Fiber Glass Systems, San Antonio, Texas. "Right now we can get fiberglass products quicker than we can get steel. That's probably another major factor why a lot of oilfields are going to fiberglass pipe."

The use of composite materials in corrosive environments such as oil fields is nearly as old as the composite industry itself. And after several decades of slowly growing penetration, industry analysts predict annual composites growth rates in the oil, gas and chemical process sectors to be as high as 12 percent in the near term, compared to an overall industry average growth rate of 5 percent.

Since its introduction in 1948 for oilfield sour crude collection, GRP pipe has grown to more than 50 percent of the oilfield pipe market. GRP performance during all those years has also provided a benchmark for pipe design and installation procedures. Many large established companies have examples of composite pipe in continuous operation for more than 50 years with trouble-free corrosion performance.

Advantages of GRP compared to steel piping are:

- Inherent corrosion resistance
- Lighter weight
- Ease of fabrication
- Lower maintenance costs
- Lower life cycle costs



The oil and gas production industry uses GRP pipe to control corrosion problems in produced fluid lines or faces replacing steel pipe every five to seven years and higher maintenance costs. It is not uncommon to produce and treat seven barrels of brine water for every barrel of crude oil brought out of the ground.

Recent improvements in the glass reinforcement strength and durability have allowed more cost-effective performance.

For example, the new Owens Corning SE 2350 Advantex® glass fiber reinforcement, introduced at ACMA 2005, has demonstrated a 14 percent increase in hoop stress and a smoother surface finish for improved handling in the field.

The improved mechanical performance allows for either an increased pressure rating or the ability for reduced thickness of existing products. The improved GRP productivity has eliminated the cost barrier for volume use in chemical, gas and oil pipelines with underground, aboveground and offshore installation.

SE 2350 reinforcement offers significant improvement over state of the art through combination of excellent processing attributes and



long-term interfacial adhesion provided by unique sizing chemistry and the inherent corrosion resistance of Advantex glass.

SE 2350 offers a 17 percent improvement in burst strength over competing products. Other industry-leading performance characteristics of the new product include:

- A 10 percent increase in cyclical regression (stress) strength
- A 41 percent increase in fabrication efficiency and 35 percent reduction in rework costs
- The opportunity to reduce pipe thickness by 10 percent
- Higher corrosion-resistance
- Higher processing efficiency
- Higher pipe quality as measured by external surface smoothness

An important feature of GRP pipe is that it weighs significantly less than steel pipe, which allows most installations to be done by hand. This requires that the surface of the pipe be smooth so people handling the GRP pipe are not scratched or cut.

Owens Corning SE 2350 reinforcement yields a much smoother surface finish during pipe manufacturing. This is accomplished with less glass fiber tension in the filament winding process when pulling from the creel.



Owens Corning Research Associate Len Adzima says the performance of SE 2350 results in part from a significant change in the chemistry of the sizing applied to the product. SE 2350 is the first roving for filament winding with epoxy resin that was specifically designed from the ground up for Advantex glass.

To conduct field tests with the new roving, Owens Corning worked closely with Fiber Glass Systems to check the product in their process and produce pipe that could be tested in the lab and field.

"We were happy to help with the development of the new reinforcement product because it will help our business grow as well," says Jerry Givens, Vice President, Quality and Process Engineering, Fiber Glass Systems.

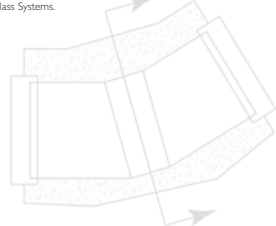
"Not only are the test numbers good but you can see a big improvement in the surface appearance of the pipe," continues Givens. "Our customers really like the look and feel of pipe made with the new roving."

In Canada where Al Mack lives and works, GRP pipe has a long and successful history. Use of the product started in southeastern Saskatchewan, gradually spread west and north and is now within 75 miles of the Arctic Circle at Norman Wells, Northwest Territories.

"We have fiberglass lines that have been in the ground for more than 35 years of production," says Mack. "Today, we are replacing some steel lines that have been in the ground as little as six or eight months. It just doesn't last in some situations. We've proved that fiberglass pipe is a viable alternative," he adds.

Note: Portions of this article were excerpted from a technical paper titled *High Performance GRP Pipe Solutions for Chemical*.

**Oil and Gas Transport** written by Dave Hartman, Research Associate, Owens Corning; Wisdom Dzoti, Program and Commercial Leader for HiPerTex® Reinforcements, Owens Corning; Mark Greenwood, Composite Solutions Consultants; and Jerry Givens, Vice President, Quality and Process Engineering, Fiber Glass Systems.



## WINNING COMBINATION

# VALUE AND INNOVATION DRIVE COMPOSITE GROWTH IN EUROPE

Owens Corning believes it has a winning formula for growing its composites business in Europe – do everything it can to help its customers grow. The execution of that plan includes delivering value to customers, helping them expand into new territories and using innovation to enable new and better applications.

"Our approach in Europe is the same as the company's strategy for growth in the rest of the world but it may be easier to see here," says Raymond Frost, Vice President, and Northern General Manager for the Composite Solutions Business.

"For example, the customer service team in Brussels is a mature organization that is unmatched by any of our competitors. Our Development Support Labs in Belgium and our sales force throughout Europe are also delivering value on a daily basis.

"We are working with our customers to develop the market for composite materials in Russia and Eastern Europe, and the introduction of HiPer-tex™ reinforcements and WindStrand™ roving and fabric in Europe is certainly the biggest market development news in our industry in recent memory.

"None of this is revolutionary," adds Frost. "This is what customers expect from an industry leader. We are simply delivering on our responsibility."

Owens Corning traces its history in Europe to March 1965 when the company established Owens Corning Fiberglas Europe, S.A. Its first factory started operations a year later in Batrice, Belgium.



The uninvited Owens Corning customer service team in Europe includes: (l-r) Jacki Elin Vuontisjärvi, Alexandra Labbe, Anetta Balazs, Mariya Khrapovystskaya, Sandra Bongiorno, Els Nys, Laura Versarate, Alberto Lopez Palacios and Fabienne Gesteiras; (r) Franjo Jelenc, Matjazko, Sylvie Gossard, Josi Jacob, Ike Verhooven, Kornelia Moss and Nancy Vanshepedal. Not pictured: Flavio Claes.

The company now operates a total of six reinforcement and fabric plants in Europe – Apeldoorn, The Netherlands; Batrice, Belgium; Birkeland, Norway; L'Ardoise, France; Liversedge, U.K.; and San Vicente, Spain.

The company continues to invest in its European manufacturing facilities. One of the largest recent projects was a \$30 million capital improvement program to increase capacity for veil products (wet-formed chopped strand mat). Europe accounts for about 60 percent of the market for veil today.

While composite technology first came to Europe from North America, many innovations today are born in Europe and travel to other parts of the world. Two recent examples are long fiber thermoplastic reinforcements made with PerforMax™ roving and the Silentex™ noise control system for silencers and mufflers.

The company's new HiPer-tex and WindStrand products were developed with substantial contributions from both sides of the Atlantic. The first two presentations about the breakthrough reinforcement platform were made in Athens and Paris.

"We launched HiPer-tex and WindStrand reinforcements in Europe because the market for wind turbine generators is much larger in Europe than it is anywhere else in the world," says Agustí Porta, Global Wind Energy Business Manager at Owens Corning.



"We expect about a 15 percent compound annual growth rate globally for wind turbines and much of that growth will take place in Europe," continues Porta. "We want to support our customers in the region by providing product and service, of course, but we also have an obligation to help stimulate the growth of the market."

"The new HiPer-tex reinforcement platform is an enabling technology because it will allow the production of longer and stiffer blades that weigh no more than current blades, and at a very attractive cost. That will reduce the cost per kilowatt hour of electricity and stimulate additional growth of wind energy."

As another example of delivering value, Porta cites work the company did to help a fabricator change the manufacturing process for making nacelle covers, the composite boxes that enclose wind turbine gearboxes and generators. Working out of its advanced fabrics factory in Spain, Owens Corning developed a new fabric that made it possible to convert production from an open-mold to a closed-mold process.

Dick Furber, European Sales and Marketing Leader, says HiPer-tex and WindStrand reinforcements are the third recent examples of using innovation and technology to drive market growth.

"In the past 18 months or so, Owens Corning also introduced new roving products for medium- and high-voltage electrical insulators (SE 9400 LS) and filament wound pipe (SE 2350). The roving for electrical applications uses technology to deliver the combined benefits of Advantex™ glass with a low seed count, and the roving for filament winding produces epoxy laminates with higher burst strength. All of these products are examples of breakthrough innovation."

Trost says the European market for reinforcements is very competitive, in part because it is the largest in the world, accounting for 38 percent of the total. Europe is also the largest thermoplastics market, with 43 percent of the total demand, supported by dynamic automotive applications. Thirty-six percent of the world's auto and transportation applications are based in Europe.

Growth rates have been steady in the region, with a compound average annual growth rate of 7 percent from 2000 to 2004. And while 2005 was basically flat, the company forecasts a growth rate of 6 percent for 2006 and 5 percent annually on average between 2005 and 2008.

Working with customers in Russia and Central and Eastern Europe are Norbert Pietruka and Milan Tomaska. Pietruka focuses on Poland while Tomaska covers 10 countries (Czech Republic, Hungary, Romania, Slovenia, Croatia, Serbia, Bosnia Herzegovina, Ukraine, Belarus and Russia).



With its northern border on the Baltic Sea, it should not be surprising that Poland has a thriving and growing marine market. The country is the world's second largest producer of motorboats and yachts up to 10 meters in length (33 feet). To serve this market in Poland, Owens Corning has two distributors with a total of 12 stocking points.

For Central and Eastern Europe, Tomaska says distribution is essential in introducing the Owens Corning brand to the market because distribution covers 40 to 45 percent of the composites business in those countries.

"Dry chopped strands are also now being used in Russia," adds Tomaska. "We have been a pioneer in introducing chopped strands to the market."

Last year, Owens Corning also took an important first step toward growing its automotive business in Central and Eastern Europe, with an agreement to manufacture Silentex™ bags in the Czech Republic.

"These are all big steps forward and demonstrate our commitment to follow and ultimately lead our customers' expansions to the East," says Frost. "We are now on the map in Central and Eastern Europe, which is important in our communication to our customers."

Birkeland, Norway  
Apeldoorn, The Netherlands  
Batrice, Belgium  
Liversedge, U.K.  
L'Ardoise, France  
San Vicente, Spain

