



MARKET

for composite solutions

AUTUMN 2008

VISION

Web Sites Upgraded

Web sites for the OCV businesses include a lot of new and helpful information including:

- Standard, high-performance, commingled thermoplastic and alkali-resistant reinforcements
- Fabrics
- Non-wovens
- Libraries of product information
- Contact information for global manufacturing and sales locations

Please visit the sites at :

Composite Solutions Business - <http://www.owenscorning.com/composites>

OCV™ Reinforcements - <http://www.ocvreinforcements.com>

OCV™ Technical Fabrics - <http://www.ocvtechnicalfabrics.com>

OCV™ Non-Woven Technologies - <http://www.nonwoventechnologies.com>

No Corrosion Here



Where Composite Materials Help Overcome Problems with Corrosion



Light at the End of the Pipe



OCV Businesses continue to Match their Manufacturing Capacities to Customer Needs



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

1-800-GET-PINK™
www.owenscorning.com

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Executive Editor: Stephane Guillon
Director, Marketing and New Business Development
OCV Reinforcements
1-419-248-6952
stephane.guillon@owenscorning.com

Managing Editor: Emmanuelle Mangenot
Global Marketing Communications Leader
OCV Reinforcements
+33-(0)4-79-75-56-86
emmanuelle.mangenot@owenscorning.com

Correspondence can also be sent to Guillon at Owens Corning World Headquarters, One Owens Corning Parkway, Toledo, OH 43659.



EDITORIAL

C O N T E N T S

GROWING BUSINESSES GLOBALLY



PAGE 4-7

Growing
in Corrosive Soil



PAGE 8-9

No Corrosion Here



PAGE 10-14

Light at the End of the Pipe



PAGE 15

Matching Capacity to Market Needs



This issue of Market Vision makes it very clear that our customers are global, growing and market leading.

These pages include articles about customers around the world - their home countries are Italy, Spain, Saudi Arabia, China, South Korea, Australia, Brazil and the U.S.

The issue will be available on the OCV business stands at China Composites in Shanghai, IBEX at Miami Beach, the SAIE building exposition in Bologna, the International Plastic Fair in Tokyo, and Feiplar Composites in Sao Paulo.

Many of the businesses are already global while others are just getting started. All of them are market leaders and we are pleased to present their stories. We thank them for their trust and for sharing their achievements for the benefit of our readers.

As we work with these customers and others, we find that the growing and global nature of the composites business is adding another consideration to the evaluation of suppliers. In addition to having the right product, consistently good quality and competitive prices, suppliers are also being asked about their ability to support a company's growth globally.

We welcome that question because global presence is certainly a major strength of our composites businesses. Owens Corning has operations in 16 countries across Europe, the Americas, Asia and the Pacific Rim. Our mission is to leverage those facilities to help our customers grow and prosper, because that is the key to our own bright future.

Let us know what we can do to help your business grow. Contact us through our Web site or send a message to marketvision@owenscorning.com.

Chuck Dana

Chuck Dana
President
Composite Solutions Business
Owens Corning



Strongwell's (U.S.) fastest growing pultrusion applications are cooling towers, environmental scrubbers, marine use and food processing.

Growing in Corrosive Soil

One person's problem is often another's opportunity. The truth of that paradox is easily seen in the market for composite materials where many companies are building a good business by helping others overcome problems with corrosion.

“ Since about 1995 or '96, the percentage of composite cooling towers has risen from about 15 percent of the market to about 90 percent. ”

Glenn Barefoot, Corporate Marketing Manager at Strongwell

“ The corrosion and abrasion resistance of composite materials is fairly well known. ”

Rod Courtney, Vice President of Field Operations

Strongwell Operating 66 Machines

Strongwell has been making corrosion-resistant composite structural products since 1956 and today has 66 pultrusion machines and more than 647,000 square feet of manufacturing space in three locations. Applications for cooling towers, environmental scrubbers, marine use and food processing are the fastest growing.

“Since about 1995 or '96, the percentage of composite cooling towers has risen from about 15 percent of the market to about 90 percent,” says Glenn Barefoot, Corporate Marketing Manager at Strongwell.

“Water that goes through the towers is chlorinated. That is very hard on wood, even if treated. And redwood and Douglas fir are becoming hard to find.”

Barefoot says protection against corrosive flue gases in environmental scrubbers is also driving demand for composite materials.

The Clean Air Act requires the addition of scrubbers to new and existing coal-fired power plants. The scrubbers operate at high temperatures (plus or minus 200 degrees Fahrenheit), which is at the upper limit of but within what composites can handle. Power companies have another five or six years to fully comply with the Act so sales of pultruded profiles for cooling towers should remain strong in the next few years.

Barefoot says marine applications are expanding in communities built in coastal areas. “These are premium properties and they want decking and handrail products that will stand up to sea water.

“The U.S. Navy is also beginning to use composites for handrails, walkways and deck houses,” continues Barefoot. “For years, I think they resisted FRP because they had plenty of seamen who could paint metal. Now they must have better things for those seamen to do.”

<http://www.strongwell.com/>
1-276.645.8000

Making it Big in Composites

Ershigs is a company that has made it big in composites.

Literally big - their largest product currently under construction is a fiberglass-reinforced polymer (FRP) flue gas scrubber shell that is 119 feet in diameter (>36 meters). For another recent project they designed, manufactured and constructed five FRP vessels that are 88 feet in diameter and 75 feet high (26.8 x 22.9 meters, respectively).

How does Ershigs deliver such large composite fabrications? They don't. The large diameter FRP vessels are filament wound on site and typically fabricated directly on their permanent foundation using mobile field winding equipment. The company has had as many as a dozen such projects going on simultaneously across the U.S. with several hundred people working at the sites.

The activity has been driven by the U.S. Clean Air Act, individual state laws and plant rulings that include compliance deadlines for the reduction in sulfur dioxide emissions. When flue gas desulphurization (FGD) is in the form of a wet scrubber, FRP becomes an attractive material due to its corrosion resistance in a wet acid and potentially high chloride environment. Ershigs volume has more than quadrupled in the past four years as power plant customers scramble to install large scrubbers to meet compliance deadlines.

“It has been a good run,” says Steve Hettick, Vice President of Manufacturing. “We expect demand to level out in 2009, but we will likely see strong opportunities in the power market through 2020.”

Headquartered in Bellingham, Wash., Ershigs, Inc. was founded in 1921 as a sheet metal fabricator of industrial ducts. The company expanded into FRP in 1960 to make products for the pulp and paper industry. Ershigs' field winding started more than 30 years ago.

Ershigs is now owned by Denali Inc., a privately held company founded in 1995, which has become the world's largest supplier of corrosion-resistant FRP fluid and fume handling products. Denali companies include Ershigs, Belco Manufacturing, Fabricated Plastics Ltd. and Containment Solutions.

“The corrosion and abrasion resistance of composite materials is fairly well known,” says Rod Courtney, Vice President of Field Operations. “Less known is the ability to design and manufacture large corrosion-resistant FRP equipment for job site applications where alloys, clad steel, rubber lined steel or coated steel have historically been used.”

Chaun Trenary, Vice President for Marketing and Sales, says the company is pleased with the success in the FGD market while they focus on identifying their next big opportunity.

“We are a specialty contractor and large complex FRP products and projects are our niche,” says Trenary. “We see some pretty interesting challenges in chemical processing, alternative energy and mining that we can serve with our capabilities,” he explains. “We expect to bring lessons learned from our recent projects to solve future challenges in these other markets.”

<http://www.ershigs.com/>
1-360-733-2620 or 866-408-1338



Ershigs (U.S.) has produced filament wound FRP vessels that are 88 feet in diameter and 75 feet high (26.8 x 22.9 meters).

Growing in Corrosive Soil

Stabilit Keeps Eye on Future

The next time you see someone wink, the Stabilit companies hope you remember their products - translucent and opaque composite sheets for the construction and transportation markets.

The blinking woman featured on their Web site helps convey the message that Stabilit makes some composite sheets you can see through and others that you can't.



Stabilit Europa (Spain) produces translucent and opaque composite sheets for the construction and transportation markets.

“The high strength and low weight of composite materials offer an alternative to other materials that can suffer from corrosion and other damage caused by the environment.”

Joan Vila, Commercial and Marketing Manager for Stabilit Europa

There may be another message in that wink when you realize how Stabilit has built a thriving contemporary business on one of the oldest reinforced plastic applications - panels made with resin and glass fiber reinforcements. The Stabilit factories produce translucent sheets that provide natural lighting in all types of buildings, and opaque sheets for cladding in the building industry and in the bodies of commercial trucks and trailers.

Stabilit, S.A. de C.V. was founded in Monterrey, Mexico in 1959. The company was acquired by the IMSA Group in 1975 and today is part of the VERZATEC Group. Stabilit Europa was founded in 2000 as the Spanish subsidiary to serve the European market with operations in Barcelona. Together, they are among the largest companies in the world manufacturing and marketing fiberglass reinforced plastic sheets with nearly 50 years experience in the field.

The Stabilit companies stay young and contemporary by continuing to push for new technology, new processes and new applications.

“Growth of composite materials in the construction market will be based on the development of new products with upgraded features in terms of insulation, strength, light diffusion, fire and chemical resistance, lightness, easy installation and cost,” says Joan Vila, Commercial and Marketing Manager for Stabilit Europa.

“The high strength and low weight of composite materials offer an alternative to other materials that can suffer from

corrosion and other damage caused by the environment,” he continues. “Life cycles are increased and maintenance costs are reduced with composites. At the same time, composites are flexible and can form many types of products and surfaces that are appreciated by architects and design engineers.”

Vila says the most critical performance characteristics for composite panels today are durability and fire safety in construction, and aesthetics and light weight in the truck and trailer industry.

He also says Stabilit considers OCV™ Reinforcements a global partner, deeply involved in the development of new products and processes, and in their philosophy of continuous improvement rooted in Six Sigma.

“We make an effort with all of our providers to develop new products or variations of the ones that exist in order to satisfy new requirements and, at the same time, do it with our own contribution so that we gain a competitive advantage for a long time.”

Golden Phoenix Rides Electrical Growth in China

Since 1980, China has led the world in the growth of electricity production. The country's installed capacity increased nearly 8 percent annually from 1980 to 2002, a rate 5.3 percent higher than the world's average and 6 percent higher than the developed countries in Europe and the U.S.⁽¹⁾ More recently, China has experienced growth rates at about 10 percent, which are expected to continue.⁽²⁾

One composite company benefiting from that rapid growth is Zhejiang Golden Phoenix Electrical Co., Ltd., an enterprise specializing in the development and production of insulating parts for high voltage applications. The company was established in 1994 and today has annual sales exceeding US\$20 million and more than 350 employees.

Golden Phoenix focuses on manufacturing FRP rods, composite bushings, composite insulators, medium and high voltage cable accessories and epoxy resin insulators. Its products serve power systems ranging from 10kV to 1000kV.

According to Mrs. Chen Dan Hong, Vice General Manager at Golden Phoenix, 60 percent of the company's product is used in China and 40 percent is exported.

Mrs. Chen says the market for their products has been growing at around 20 percent. But the company has grown at more than 25 percent annually due to an increase in exports.

The company's main product is insulating rods that include a composite rod and rubber coating. The product is used with wire and cable. Glass fiber from OCV™ Reinforcements includes low-seed roving (SE 8400 LS), a requirement for electrical applications where low dielectric properties are needed.

Golden Phoenix also uses ECR glass for acid-resistant electrical rods. The company uses a total of about 300 metric tons of glass fiber per month.

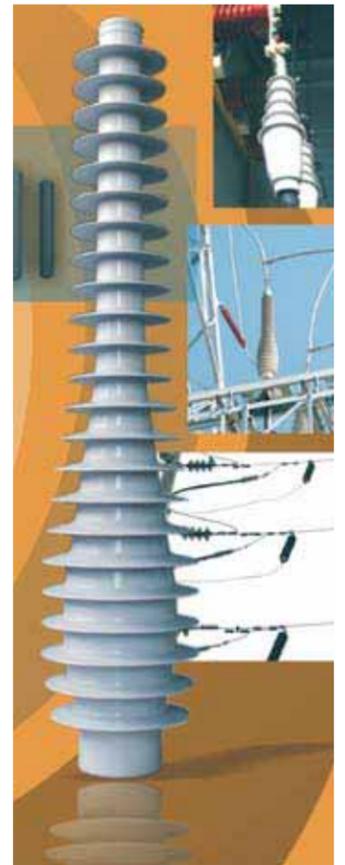
Mrs. Chen says competition comes primarily from glass rods but, Golden Phoenix is able to maintain a high market share - about 40 percent - because of its consistent high quality.

Like companies in other parts of the world, one of their biggest challenges is getting enough high-quality glass fiber reinforcements. Both Golden Phoenix and OCV Reinforcements are working hard to find a solution to support continued growth.

<http://www.gphoenix.com/>
+ 86-575-82605038

⁽¹⁾ Asia Times Online, May 5, 2005

⁽²⁾ Market Wire, October, 2007



Golden Phoenix (China) products serve power systems ranging from 10kV to 1000kV.

Fiberglass for Eternity

A nearly 100-year-old Italian company developed a new composite application it expects to last a very long time - crypts for cemeteries.

Bosisio Ltd., Milan, created a modular system with fiberglass panels that can be assembled into 100 crypts in a few days and are one-tenth the weight of traditional concrete structures. The crypts are faced with white Carrara marble held in place with bronze studs.

Benefits include minimal disruption for cemetery or mausoleum visitors because the composite crypts are assembled quickly without the use of mortar and welding so that there is no dirt, dust or danger. And thanks to the system's relatively small size and light weight, crypts can be placed in areas where concrete crypts would not be practical, such as under stairs and in tight corridors, chapels or outdoor areas.

Using the company's patented Q-box technology, the system employs an assembly concept similar to LEGO® bricks with fixed-joint interlocking connections. Clutch claws on the tips of the profiles allow the self-blocking system with clips that let the frame position itself properly. A central hole has a threaded bushing to allow the positioning of the studs that support the marble plates.

Composite Q-box panels are produced with the pultrusion process using single end roving and polyester resin.

After success in Italian market, the company is bringing its patented system to the U.S. at the National Funeral Directors Association International Expo and Trade Show in Orlando in October.

www.bosisio.it +39 02 57600504



Bosisio Ltd. (Italy) created a modular system with fiberglass panels that can assemble 100 crypts in a few days.

No Corrosion Here

Demand for Non-Corrosive Applications Growing Smoothly

Matt Lieser, Global Market Intelligence Leader, OCV™ Reinforcements, sees two megatrends driving the growth of composites in corrosion-resistant applications - increasing demand for energy and a scarcity of water. Both are driving demand for composite materials in the Middle East.

"Glass fiber demand in the Middle East has increased more than 35 percent each year since 2004," explains Lieser. "A lot of that increased demand has been for potable water pipelines and the extraction and refining of oil. Much of the balance has gone for desalination projects and sewage systems."

Lieser says energy demand includes everything from traditional oil production and refining to coal mining, liquid natural gas terminals, ethanol fuel plants, coal and natural gas power plants and wind energy. The production of mining and oilfield equipment has seen double-digit growth in the past four years, including a whopping 29.9 percent increase in the U.S. in 2006. Customers have told us that similar growth is being felt in Asia, Latin America, the Middle East and some European countries. High crude oil prices are obviously the catalyst for oilfield pipe demand.

There is a near-perfect storm raging in the market for non-corrosive applications of composites. About the only thing keeping it from being truly perfect is the slowdown in the U.S. economy.

There are other factors, however, driving the market globally and making it very robust at the moment. One is increased activity in corrosive environments such as oil wells, desalinization facilities, mines, coal-fired power plants and coastal property. Another factor is the rising cost of aluminum and stainless steel. A third is the scarcity and cost of certain types of lumber.

"We have always been competitive with aluminum and stainless steel but, now we are the low-cost guys," says Glenn Barefoot, Corporate Marketing Manager at Strongwell Corporation, Bristol, Virginia, U.S.

Barefoot says engineers were willing to pay a little more for stainless steel a few years ago because they were more familiar with the material. But that is changing as the price difference gets larger and harder to dismiss.



Cost of Corrosion

Lieser says the cost of corrosion has been estimated at more than \$300 billion annually in the U.S. alone⁽¹⁾.

And according to the Alberta Energy and Utilities Board (AEUB), corrosion is the leading cause of oil pipeline failures⁽²⁾. The Board, which oversees about 385,000 kilometers of high pressure oil and gas pipelines, says there are typically about 750 failures annually.

In a study conducted in 2006, 53 percent of the failures were due to internal corrosion. The next leading cause of failure was external corrosion at 12 percent. All other causes paled by comparison: third party damage, 8 percent; construction damage, 5 percent, and all others including welds, joints, fittings, seams and earth movement, 22 percent.

Advantex® glass

To support the growth of composites in corrosion resistant applications, OCV Reinforcements is rapidly converting its batch-melting furnaces to Advantex® glass, a boron-free formula that produces corrosion-resistant glass fibers.

Advantex® glass is both an E-CR (corrosion resistant) glass and an E-glass, in accordance with ASTM D578. Field experience also shows that the product performs well in any aqueous environment, including water and alkaline solutions. Advantex® glass products also have a higher softening-point temperature and a higher tensile modulus than traditional E-glass, which are beneficial in some applications.

“Glass fiber demand in the Middle East has increased more than 35 percent each year since 2004.”

Matt Lieser, Global Market Intelligence Leader, OCV Reinforcements

High-Performance Reinforcements

The company's new high-performance reinforcements also offer enhanced long-term corrosion resistance.

As reported in JEC Composites Magazine by Claude Renaud, Innovations and Applications Development Leader, OCV Reinforcements, corrosion test results all clearly indicate that high-performance reinforcements offer enhanced long-term corrosion resistance.

⁽¹⁾ FHWA funds Cost of Corrosion Study. Total direct cost of corrosion in analyzed sectors equaled \$137.9 billion per year in 1998. Extrapolated to U.S. economy, cost of corrosion is \$275.7 billion per year in 1998.

⁽²⁾ Alberta Energy & Utilities Board, April 2006

Corrosion-resistant applications that capitalize on the properties of composite materials include:

- **Cooling towers** for power companies, industrial plants, refineries, convention centers, universities and other large facilities
- **Grating** in chemical plants and other corrosive environments
- **Piers and pilings** for waterfront use where corrosion-resistance is needed
- **Pipe** to move water and corrosive byproducts in mining and refineries
- **Pollution control systems** in manufacturing and power plants
- **Rebar** for concrete construction
- **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

Resource Center

Sustainability Report 2007

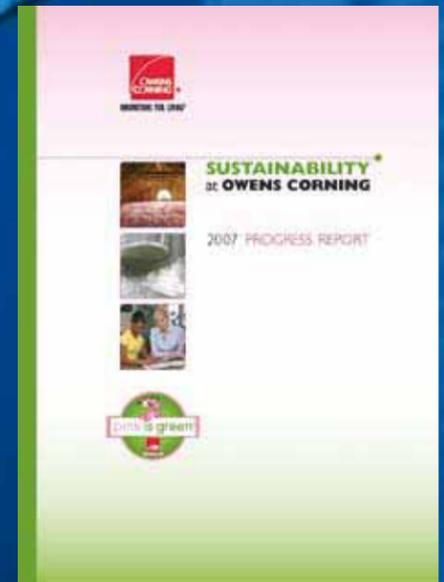
A second progress report on Sustainability at Owens Corning is now available. The report details movement toward the commitments communicated last year in the initial report.

"Beyond an initiative, sustainability is a core strategy of our company that we define as meeting the needs of the present without compromising the world that we leave to the future," says Frank O'Brien-Bernini, Chief Sustainability Officer at Owens Corning.

"A principal activity of the company is developing and producing products that help our customers grow their businesses by serving the world's need for sustainable growth and development.

"Owens Corning made significant progress on our sustainability strategy in 2007," continues O'Brien-Bernini. "We improved the safety of our operations and reduced the number of employees who were injured. We reduced key aspects of our environmental footprint and our people contributed substantially to the quality of life in the communities where we operate. While we are pleased with our progress, we have much more to achieve."

To download the 2007 progress report on Sustainability at Owens Corning, go to <http://www.owenscorning.com/sustainability/>. To request a printed version, send your mailing information to sustainability@owenscorning.com.



Light at the End of the Pipe

After many years of steady growth, the use of large-diameter glassfiber-reinforced polymer (GRP) pipe for water and sewage projects is increasing dramatically around the world.

According to a global market analysis developed earlier this year by Owens Corning, the combined market for pipe and tanks consumed more than 400,000 metric tons of glass fiber in 2007. The two markets are expected to have a global growth rate between 15 and 20 percent in 2008.

The largest GRP pipeline project in the years 2006 to 2008 is the 265 kilometer Oguz-Gabala-Baku water project in the Republic of Azerbaijan. Last November, the Amiantit Group of Saudi Arabia reported orders from just three counties that totaled more than €34.5 million (US \$54.8 million).

- Other infrastructure projects include:
- A \$9 billion recycled water project in Queensland, Australia
 - PROINFA legislation in Brazil funding wind energy and pipe for power plants

With the increase in activity, several large-diameter composite pipe companies are experiencing phenomenal growth.

Amiantit and Flowtite™ Pipe

The Amiantit Group, Saudi Arabia, is an enterprise with many facilities. The company already operates 30 manufacturing plants around the globe and is setting up additional lines as you read this. It also operates six technology companies to support the factories.



Amiantit (Saudi Arabia) is able to produce pipe that is four meters in diameter with highly robust flexible joints for high pressure applications.

Amiantit was a business and joint venture partner with Owens Corning beginning in 1977. The relationship included the ownership and operation of several pipe facilities in the Owens Corning Engineered Pipe Systems business. Amiantit acquired most of the business and its Flowtite™ technology in 2001.

Flowtite technology is the world's leading GRP pipe technology with some 20 manufacturing licensees and more than a quarter century of materials technology and design experience in fluid handling systems. A cornerstone is the continuous winding process that evolved from equipment developed in the 1970s by Danish inventor Frede Hilmar Drostholm.

Since acquiring the technology, Amiantit has improved the process and extended its use globally. In recent years, Amiantit announced the production of pipe that is 4 meters in diameter and a breakthrough with its joint for high pressure applications.

When announcing successful tests of the joint in July 2006, Eng. Fareed Al-Khalawi, former Amiantit President and CEO, said it was a groundbreaking event.

"Passing this test proves the robustness of our flexible joint and demonstrates Amiantit's ability to design and manufacture GRP products for high pressure applications" he said. "This development now enables us to bring forward pending projects in the Middle East, North Africa and Latin America, and paves the way for further expansion of the Group."

<http://www.amiantit.com/>

Fibrelogic Grows in Dry Australian Climate

The growth of Fibrelogic near Adelaide in South Australia is another interesting story. It begins a little more than six years ago when Martyn Manuel was the sales manager for a company making discontinuous filament-wound glassfiber-reinforced polymer (GRP) pipe. The business experienced financial problems and was headed for the dustbin when Manuel and his wife opted to buy the assets and start a new business named Fibrelogic Pipe Systems Pty Ltd. Employees totaled 10.

By the time the first fiscal year ended in mid-2003, Fibrelogic had surpassed all of the former company's sales records with more than US \$5 million in revenue.

Growth continued for the next few years and in 2005, Manuel made a fateful decision to license the use of Flowtite technology and acquire a large-diameter continuous winding machines from Amiantit.

This immediately opened the door to a new range of projects. The company now has more than 140 employees who have made in excess of 200 kilometers of FRP pipe. It is now the largest composite manufacturing firm in Australia.

The largest project to date for Fibrelogic was the Western Corridor Recycled Water Project in Queensland. Fibrelogic finished its part of the project this year, providing 86 kilometers of pipe and fittings. The pipe was 1 to 1.2 meters in diameter and rated for 16 to 25 bar pressures.

"That was a dream project," says Manuel. "We finished ahead of schedule with no quality problems."

Manuel's dream project also included a few logistical nightmares as he faced the challenge of getting product to a project

2,500 to 3,000 kilometers from his factory near Adelaide. The solution was a combination truck-and-rail system that put loaded truck trailers onto rail cars near the factory. Thousands of kilometers away in Brisbane, the trailers were taken off and moved to the job site.

"We have a dry climate and the population is growing so water recycling and desalination projects will continue."

Manuel and his team are looking at a few projects now that will require 200 to 300 kilometers of large-diameter pipe. And then there are some 10 kilometer projects close to home that cause him to chuckle.

"It is amazing how our thinking has changed in the past few years," he explains. "What we consider a small project today was unthinkable large before we got the continuous machine."

<http://www.fibrelogic.com/>
+61 8 8329 1111



Fibrelogic (Australia) faced the challenge of moving product to a project 2,500 to 3,000 km from its factory.

Amitech Busy in Brazil



Amitech (Brazil) can produce pipe using both the filament winding and the centrifugation process.

Well known for Carnival and football, Brazil is also becoming a hotbed of composite pipe production led by Amitech, a company owned by Inversiones Mundial of Colombia and Amiantit of Saudi Arabia.

Established in 2000, Amitech is already the largest Brazilian manufacturer of fiberglass-reinforced polyester (FRP) pipe. The company's plant in Ipeúna, in the state of São Paulo, produces several kilometers of pipe monthly for use by the agricultural, industrial, energy and basic sanitation.

Fueling the growth of FRP pipe in Brazil is legislation known as PROINFA, which funds infrastructure projects including pipe for small power plants. Government funding is also available under the Brazilian Economic Acceleration Program.

In June, Amitech announced that it expanded its production capacity and now has the ability to produce 330 kilometers of pipe per year with diameters up to 3,000 mm. Before expanding, the company could produce 120 kilometers of pipe per year with diameters between 400 mm

and 1,200 mm. The investment in the expansion was US \$9 million.

Most of the funds were invested in a Flowtite machine from Amiantit. The new equipment's capacity is already full for the next three months due to agreements signed at the end of last year.

Before the expansion, Amitech used centrifugal casting technology exclusively.

"With the new machine we have supplemented our portfolio," explained Benedito Buso, Amitech's industrial manager. "Although Flowtite equipment is outstanding because of its speed and ability to produce larger diameters, centrifugation ensures us more flexibility since we have six independent workstations. We are able to produce pipe with different diameters at the same time."

Last October, Amitech reported its eighth deal of the year to supply pipe for a small hydroelectric plant (SHP). The agreement was for 950 meters of pipe for the SHP of Nhandu, which is under construction in the city of Guarantã do Norte, in the state of Mato Grosso.

"We are manufacturing FRP pipe with 2,700 mm and 2,900 mm diameters, which will be installed replacing the conventional square galleries of framed concrete," said Flávio Marçal, Amitech's Sales Manager. "For the conditions of low pressure, the galleries are an expensive solution, and with a longer installation term than the FRP pipe."

"We are optimistic about market prospects for the next two years," said Flávio Marçal, Amitech's commercial manager, who estimates a high increase in the company's earnings this year.

<http://www.amitech.com.br/>

Kolon Water Leveraging Technology

Since 2006, the South Korean government has been implementing a program to replace corroded steel pipe installed in water and sewage systems 30 or more years ago. The switch to corrosion-resistant glass-reinforced polymer (GRP) pipe is taking place in this environment and the rising price of steel is speeding it up.

The largest Korean composite company capitalizing on those trends is Kolon Water, a business operated by Kolon, Inc. Founded as a chemical fiber manufacturing company in 1957, Kolon Inc. has been leading the Korean chemical fiber industry for past 50 years. The company recently expanded into various-diameter GRP pipe.

Kolon Inc. is a member of the Kolon Group (US \$5.6 billion revenue and 7,000 employees) with annual sales of US \$1.6 billion and 2,450 employees.

A key to growth for the entire Group has been technology. The business has 920 registered patents and acquired the rights to apply more than 3,000 patents, including 170 from outside the country.

"Water has become one of humanity's most precious and scarce resources," says Jae-Young Kim, Composite Business Team Leader at Kolon Industries, Inc.

"Through the development of advanced environmental technology, our own unique system and the implementation of a competitive business strategy, Kolon Water has advanced not only in Korea, but also in China, the Middle East and Southeast Asia.

"Kolon Water is now building on the Group's heritage with a total water solution based on company divisions that are in core segments of the water industry," explains Kim. "We are establishing a total value chain based on this solution by strengthening our capacity in all areas of the environmental industry, including the control of waste matter and recycling."

Kim says the company's biggest challenge is to change the stereotype of end users who want steel pipe only.

"Steel pipe still has a 70 percent market share in sewage and potable water pipe in South Korea, but Kolon is working to expand the share of GRP pipe," says Kim. "End users who know about the advantages prefer GRP pipe," he continues. "But many end users are still in the market for steel pipe as they have always been."

To overcome that mindset, Kolon is working with OCV™ Reinforcements to communicate the 70-year history of glass fiber and its benefits.

Another challenge is productivity. Kolon is trying to maximize its productivity and is working with the OCV Reinforcements technical team at the factory in Kimchon, Korea, to minimize waste in its process.

"OCV Reinforcements supplies not only glass fiber, but technical support for the fiber, the filament winding process, new markets for GRP and documentation about the safety of glass fiber," says Kim.

<http://www.ikolon.com/eng/business/index.html>



Kolon Water (South Korea) is teaming up with its sister companies in the industry to offer a total water solution.

Light at the End of the Pipe

Behind the Veil

Pipe production with continuous filament winding machines uses tons of glass fiber reinforcements, of course. Most of the reinforcement - about 95 percent - is roving and fabric. The remainder is glass fiber non-woven surfacing veil, a product very important to the finished pipe's performance.

Veil is typically applied to the mandrel at the beginning of the manufacturing process. It enables the smooth, resin-rich surface that constitutes the inner lining of the pipe. It provides the corrosion-resistant surface that supports higher hydraulic efficiencies for water and other liquids. Flow velocities of up to four meters per second can be used if the water is clean and contains no abrasive material.

The smooth interior surface also saves pumping energy and costs. And very low fluid resistance can either increase the discharge of the fluids compared to the same diameter of pipe made with traditional materials or allow reduced pipe diameters that meets a required discharge flow rate.

In contrast to other corroding materials, the inner surface of GRP pipe does not change with time. There is no scale build up and no further degradation.

Veil can also be used on the exterior of pipe and tanks to provide a smooth and visually appealing surface. Both interior and exterior applications of veil strengthen the corrosion resistance of the composite by preventing surface weakness.

The broadest range of surfacing veils for pipe is available from OCV™ Non-Woven Technologies. Widths range from 35 mm to more than 2 meters. Roll lengths are available up to 750 meters.

Veils from OCV Non-Woven Technologies are available in C-glass (dry-laid) or Advantex® glass (wet-laid ECR-glass). A wide range of binder systems are available for compatibility with both polyester and epoxy resins and varying styrene-solubility to suit process requirements.

<http://www.nonwoventechnologies.com>



Matching Capacity to Market Needs

Owens Corning Composite Solutions continues to match its manufacturing capacity to customer needs. Following are highlights from more than 200 capital projects underway at the moment within the composites businesses.

Advantex® Glass Projects

One of the most significant projects is the conversion of all batch-melting furnaces to Advantex® glass, a boron-free formula that produces corrosion-resistant glass fibers. One of the first plants to be converted is **Hangzhou**, China. Plants in Spain and Italy will also be converted in 2008.

According to Anne Berthereau, Advantex® project leader, the Hangzhou conversion was done safely as the furnace continued operating while the new batch material was introduced.

"The process was continuously adjusted during the transition to continue making multi- and single-end roving," says Berthereau.

A second project is now ongoing at Hangzhou converting the plant's two furnaces to one. This change will reduce energy consumption while increasing capacity by more than 50 percent.

"These changes were unheard of before but now are possible since the formation of OCV™ Reinforcements," she adds.

Expansion in Russia

In July, OCV Reinforcements announced it will double the capacity of its glass fiber composites facility in **Gous-Khrustalny**, Russia, to meet growing global demand.

The investment will serve existing customer growth in Russia and throughout Europe and the Middle East.

The expanded facility in Russia will produce a comprehensive range of composite products using the company's best technology for glass fiber production and fabrication. It will incorporate the company's Advantex® glass and advanced glass-melting (AGM) technology platforms.



The growth rate of glass fiber composite demand in Russia is estimated to be greater than 10 percent per year, and growing at nearly twice the rate of gross domestic product (GDP) around the world. Construction is planned to begin in 2008, with start-up anticipated by the end of the fourth quarter of 2009.

U.S. Projects

At **Amarillo**, Texas, the company is further investing in the composite industry by expanding capacity to produce single-end roving by about 40 percent.

At **Anderson**, S.C., a project for dry-use chopped strands (DUCS) is nearly complete. The plant is expanding DUCS production by adding a state-of-the-art furnace and other new equipment.

At **Jackson**, Tenn., the company added advanced glass melting (AGM) technology with oxygen firing. The plant makes wet-use chopped strand.

High-Performance Reinforcements

Another significant project involves the installation of capacity for high-performance reinforcements at the OCV™ Reinforcements plant in **Mexico City**. The furnace was lit in June and the plant began shipping product in July.

"The Mexico City project is a good example of OCV Reinforcement's commitment to the market place and our ability to move with speed responding to our customers' changing needs," says Project Leader John W. Campbell.