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From fields of hemp to spider webs, the world produces tons of biomaterials composite manufacturers can use to create eco-friendly products. In both diversity and quantity, organic composites are on the upswing as more manufacturers investigate the benefits of these new material applications. By Jan Fletcher

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The composites industry is at a point of no return in terms of demand for growth, but our community lacks a shared vision for eliminating the primary barrier to that growth, namely, the time scale and cost for product development and certification. By R. Byron Pipes

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Marketing has changed dramatically in the past few years. However confusing it may seem, industry leaders are finding ways to effectively market themselves using the right tips, tools and measures. One of the biggest things they’ve learned is that the megaphone technique isn’t working—and it’s time to become magnets. By Angie McPherson

About the Cover: The spider silk of the orb weaver spider, like the one on the cover, is used to create bio composites.
Selling Composites and Green Jobs

It’s the latest buzz phrase, green jobs! But what is considered a green job? What’s more confusing is that I hear the phrase everywhere but the definition is always different. When I was appointed to Governor Kitzhaber’s Transition Team to Grow Green Jobs in Oregon, the first question I asked was, “What’s a green job?” I was told that since my company employs wind turbine repair technicians, we’re categorized as a “green job” employer. Then I asked, “When the same employee returns from the field and works on an RV part, is it considered a green job?” This stirred quite a lot of conversation.

From this incident I realized I could make a good case that composite fabricators were performing green jobs. Most of what we do is in some way making or replacing another material that is more energy consuming or being used in some unsustainable way. For example, our company makes composite component parts for various transportation products, which reduce weight thus saving energy. We also make air scrubbers to clean the air and wastewater treatment tanks as well as lubrication pit systems.

Since I convinced the Oregon Workforce Investment Board, composites manufacturers have been listed as a green job in the state. This listing is beneficial in many ways, including making us eligible for workforce training grants and being asked to present at sustainability summits to address more productive and efficient green workforce to training employees in green jobs. In my presentations I focus on implementing lean manufacturing practices, airless spray guns, low styrene resins, the use of soybean resin and other natural materials. I also mention ACMA’s Green Composite Committee and the progress they are making with the Life Cycle Assessment tool.

I am amazed at how interested people are about what our industry is doing, especially the importance of reducing weight as gas prices climb. They also see the importance of sustainable products being built like scrubbers, mass transportation, etc.

Last month I attended the 1st Annual Pacific Northwest Clean Technology Defense Symposium. As you may know, the Department of Defense (DOD) has put in place a number of policies and goals to make all of its installations more sustainable. The focus of the symposium was for stakeholders in the clean technology industry to meet and engage on their efforts and products to the DOD. It is looking for small businesses and clean technology firms to make its local installations more sustainable. It needs our help to introduce composite products, materials and ideas.

This is a great time for composites. There is more focus in the U.S. now than ever before on energy efficiency —and composites are the answer. There are a lot of training dollars targeted at green jobs within each state, I encourage you to get your state to consider composite jobs as “green jobs” so you can take advantage of valuable training dollars. These funds can be used for CCT training, lean manufacturing training or updating your building to be more energy efficient. Keep this in mind as you are networking, especially with government agencies. Sell yourself and composites—it really is not hard to do.

Lori Luchak
Miles Fiberglass & Composites, ACMA President
lluchak@milesfiberglass.com
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Top 5 All-American Supercars

The Geneva Auto Show in March and New York Auto Show in April showcased stunning new supercars and concepts like the Infiniti Emerg-E. However, the dearth of American supercars made Composites Manufacturing reflect on the top American composite supercars and how they impacted the industry. So, here’s our list, in chronological order, of the most composite-influenced American supercars of all time.


Great Scott, the DeLorean is back! That’s right, this aluminum pop-culture icon was originally manufactured in North Ireland, but this American composite remake is creating a huge splash in the industry. DeLorean Motor Car (DMC) claims the change from aluminum to composites is to ensure that the DeLorean stays “ahead of its time” just like the original design – well, at least in the second Back to the Future movie.

Texas business owner Stephen Wynne, who originally purchased the DMC name in 1995, will lightweight the new design using an electric motor and composite chassis. DMC unveiled its concept car at the International DeLorean Owners Event in October 2011. California-based company Epic Electrical Vehicles will supply DMC with a resin-infused composite body to help reduce the weight by 200 pounds. Production of the new vehicle will begin in 2013.

**Dodge Viper/SRT Viper (1991-present)**

Breaking out of the 1980’s American sports car style, Chrysler designed the Dodge Viper to resemble the 1970’s American muscle car. The Dodge Viper concept debuted at the 1989 Detroit Auto Show and in a very short turn-around time, it replaced the Dodge Intrepid as the pace car on the Indianapolis 500 racetrack in 1991. The Viper demanded attention from the industry and it gave the American market a new sports car with a bold attitude.

The 1991 Viper is also the first automotive application of carbon fiber sheet molded composite (SMC). The design included resin transfer molded (RTM) fiberglass panels and a SMC one-piece clamshell hood. In 2003 the Viper team worked with Meridian Automotive Systems (no longer in business) and Quantum Composites, Bay City, Mich., to use carbon fiber SMC, which at the time was exclusively used for exotic and racing cars, to integrate carbon fiber components on a low-volume production vehicle.

In 2009, Chrysler nearly sold the Viper to avoid bankruptcy but it couldn’t part with the fiberglass legend. Today Chrysler is working with Fiat Industrial S.p.A. (the two companies will merge under an undisclosed name by end of 2014) to restructure the organization and keep the Viper. In fact, the new 2013 SRT Viper was unveiled at the New York Auto Show in April and proved to the market that America still respects this composite supercar.

**Hennessey Venom GT (2011-present)**

In 2007, *Road & Track* magazine asked the high-performance auto
manufacturer Hennessey to enter its competition and create the first car to reach 200 mph. The original design, a modified Dodge Viper known as the Hennessey Venom 1000 Viper won the competition. But the company continued to challenge itself to make something faster.

The team pulled together a design based on a modified Lotus chassis with a Corvette engine, and slapped vacuum bagged carbon fiber panels on everything except the doors and roof. It also uses carbon fiber and forged aluminum wheels and air ducting to lightweight the design to 2,685 pounds, capable of pushing the supercar from 0-60 in 2.5 seconds. The Hennessey Venom GT is the world’s fastest composite production car in the world, currently tied with the French Bugatti Veyron Super Sport, which is primarily an aluminum design.

Fisker Karma (2011-present)

Why is Fisker Karma an American composite supercar? Mainly because other supercars like the Hennessey Venom GT aren’t fuel efficient. The California-born Fisker Karma dubbed itself the “first true electric luxury vehicle with extended range” and is capable of 112 mpg. It originally debuted at the 2008 North American International Auto Show and recently won the first People’s Choice Award at ACMA’s COMPOSITES 2012. Continental Structural Plastics in Troy, Mich., provides Fisker with low-cost SMC body panels and headlamp carriers. It uses an advanced proprietary manufacturing technique to supply lightweight, geometrically complex parts for the hybrid plug-in that help increase fuel efficiency.

Did you think we’d forget the Ford GT? Think again. Visit CM Online to read our complete list of the top 8 American composite supercars and cast your vote. 
Expanding the Peruvian Water Network

The global initiative to control waste and pollution has pushed more countries to rethink water treatment, recycling and infrastructure components. This is especially the case in Peru, which is home to 56 percent of the rainforests on earth and at one time the largest silver producer in the world.

According to the Clean Water Partnership for Arequipa, Peru, the discussion in local government to help improve the water quality of the Rio Chili began in 2006. At the time the Peruvian government intervened an astounding 75 percent of Arequipa citizens, the second largest population in Peru, didn’t have access to clean water. By 2011, the city of Arequipa had installed miles of composite piping to help bring clean water to approximately 30 percent of the population.

Peru and other South American countries started investing in water sanitation infrastructure during the mid-2000s after receiving financial support to improve local water from the global community. These donating countries are interested in protecting the Earth’s largest rainforest through improved water infrastructure. According to the Global Water Partnership (GWP), an organization dedicated to protecting the world’s water resources, approximately 28 percent of the freshwater in the world is located in South America. GWP predicts that by 2050, 30-60 percent of the rainforest in Brazil could be irreversibly replaced by a dry savannah.

To prevent this natural catastrophe and further global warming, countries like Spain—which spent $1.5 billion in 2009 to support clean water developments in Latin America—are funding projects to protect the world’s shrinking natural resource. In order to implement new infrastructure quickly and effectively, many South American countries are turning to composite solutions, and specifically composite piping. For example, the Peru Minister of Housing, Construction, Water and Sanitation, Juan Sarmiento, enacted the Water For All or (Agua Para Todos) program that supported a composite pipe project in Arequipa.

Water treatment plant for Arequipa

In 2010, U.S. resin supplier AOC supplied South American composite manufacturing company O-Tek Internacional in Medellin, Colombia with Vipel unsaturated polyester resin to produce 1.9 miles of Flowtite fiber-reinforced polymer (FRP) pipes. Since AOC is familiar with the Flowtite manufacturing process and supplies a resin similar to the one O-Tek regularly uses to manufacture composite piping, O-Tek ordered a small quantity of resin to help complete the water treatment project.

The pipes are manufactured by O-Tek using a Flowtite trademarked manufacturing process (developed in 1977 by Flowtite Technology AS in Sandefjord, Norway), which is filament wound process using glass fiber reinforced polymer (GFRP) roving wound onto a mandrel in a continuous process where cut glass, sand and polyester or epoxy are added to the product. O-Tek is one of 22 plants worldwide that produce potable water pipes using Flowtite. It was chosen for the project to help eliminate joints in the piping, which is where many water pipe leaks occur. AOC worked with Flowtite many years ago and had compatible resins that are corrosion resistant against wastewater treatment chemicals.

Three different pipes were manufactured to manage internal pressure ranging from 145 to 464 pounds per square inch to move the rapid water from the river to the new plant. The 1.9 miles of piping are used for two independent tunnels, one as an interior liner spanning 643 feet (and is...
not impacted by interior or exterior soil pressure), the other 4,167 feet are used as aerial piping, which does take advantage of the internal pressure requirement ranges.

The benefits of composite pipes over competitive materials are inherent and include longer life, corrosion resistance, smoother pipe surface for the water to move faster, and lighter pipes for builders to install. “Really this project is a testimony to the benefits of composite potable water pipes in South American countries. Many cities in South America have aging or under developed water infrastructure, they could use composites to quickly and effectively implement new pipes,” says Jeff Holshevnikoff, business development manager South America at AOC. “And South America is seeing a huge rise in composite manufacturing, which will allow that development. Just take a look at the growing economical data from the composites industry in Brazil!”

The bigger picture
Sadly, water sanitation isn’t only a problem for South America. Many countries around the world don’t have easy access to potable water. According to UNICEF, over 2 billion people around the world don’t have access to clean water.

Fortunately, governments are starting to see the benefits of clean water sanitation. Soon many countries will need to invest in new water infrastructure, suggesting that there may be an even larger global application for using composite pipes and CIPP to help make access to clean water more readily available.

Looking closer to home, many U.S. water pipelines are reaching their 50 year limit. That’s 800,000 miles of water and 500,000 miles of sewer pipes that will need to be replaced in the next 10 years. “Opportunities for Fiber Reinforced Plastics (FRP) Pipe in 2010-2015,” a report by composite consultant Lucintel, predicts that the global market for FRP pipes will reach $563.1 million by 2015.

Angie McPherson is the communications coordinator at ACMA. Email comments to amcpherson@acmanet.org.

For more stories like this, visit compositesmanufacturingblog.com and search keyword “pipes.”
If two elephants were suspended at the same time by a thin composite strip one-tenth of an inch thick and one inch wide, what are the chances they would break the strip and fall? According to Advaero Technologies in North Carolina, zero (unless you have two African Savanna elephants, which weight up to 16,500 pounds each.) A new 150 gsm bi-angle non-crimp carbon fiber produced by Chomarat and cured using Advaero’s Heated Vacuum Assisted Resin Transfer Molding (HVARTM) technology will be able to withstand the weight of 24,000 pounds — the equivalent of two average elephants — before breaking. Not only would this technology make composites competitive against metals, it could be an entry card for applications in new markets.

Dr. Ajit Kelkar, professor and chair of the Nanoengineering Department at the Joint School of Nanoscience and Nanoengineering at the North Carolina A&T State University (NC A&T), and co-founder of Advaero Technologies, is excited for the HVARTM composite manufacturing breakthrough and what this new technology means for the industry.

Last year, Advaero Technologies, a spin-off company based on research from NC A&T State University, began working with a global consortium including Stanford University and Chomarat Textile Industries to develop the next generation aircraft using cheaper out-of-autoclave technology. “We decided to start our research with regular vacuum assisted resin transfer molding (VARTM), to build similar parts using a new fabric designed by a member of our consortium at Stanford,” says Kelkar.

Dr. Kelkar has an extensive 30 year career in aerospace composites. He knows the difficulty in curing aerospace quality parts at room temperature is that resins don’t reach the correct viscosity to flow to all the sections in the mold like it would in an autoclave. Thus, the team decided to wrap the mold in heat blankets to increase the temperature of the resin to be distributed throughout the part. After weeks of trial and error they finally developed a helicopter piece that was just as strong as the autoclave manufactured part.

Benefits beyond autoclave
The group found the benefits of HVARTM were tremendous compared to other comparable processes. It resulted in better resin viscosity, a 65 percent fiber volume fraction, which is similar to autoclave cured parts, part strength equal to autoclave, and a cheaper and mobile manufacturing process with the ability to create recycled carbon fiber parts. Advaero is currently designing replacement carbon fiber parts for the Boeing CH-46 helicopter to help reduce weight and the price of current aluminum parts.

Greg Bowers, co-founder of Advaero Technologies, knows this technology is on the leading edge of composite manufacturing. He believes HVARTM already has a number of non-structural applications for aerospace components, and that future developments will lead to better composite recycling and more productive wind energy blades.

“We have tons of new developments in the pipeline. We know this technology works well using recycled materials, which suggests this process could be useful for recycling old composite parts when the industry starts looking for ways to recycle fiber. Additionally, wind blade manufacturers can make larger blades using HVARTM by bringing the materials and tools onsite to reduce transportation costs and avoid highway restrictions on oversized loads,” says Bowers.

HVARTM shows an improvement in composite manufacturing processes to meet the changing economic and material needs of the marketplace. Advaero will continue to research and develop the material and processes that can produce unmatched material strength. They expect that bringing this technology to the commercial marketplace will spur interesting new composite products for a lower price than autoclave.

Angie McPherson is the communications coordinator at ACMA. Email comments to amcpherson@acmanet.org.

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Despite the stiff economic headwinds that are usually encountered with wind-power projects, Makani Power, Inc.’s flying, tethered, wind turbine could beat the odds. Corwin Hardham, CEO and chief technical officer for Makani, says kiting, a much lighter wind turbine positioned at higher altitudes, where wind is more brisk and consistent, changes the economics of wind-power production.

Designed to use strong, light composites made of mostly carbon fiber, the Makani Power turbine soars in a circular motion, like a kite, while tethered to the ground. The electricity generated from the turbine’s blades flows through the tether. The turbine operates at a much higher altitude than a tower-mounted turbine, using just 10 percent of the material typically used in a pole-mounted wind turbine, says Hardham.

“Wind turbines onshore are about 100 tons a megawatt (MW), and for us, our wing weighs about two tons per MW, and then we have somewhere around eight tons in the ground-station support equipment,” he says. “These are very rough numbers, but it will give you an idea of that 90 percent reduction in mass.”

“There’s a lot of enthusiasm about this and it’s partially because of the dramatic cost reductions we offer, particularly in terms of cost to energy,” says Hardham. “We’re talking about being able to get down to three cents a kilowatt-hour (KWh), and offshore somewhere between six and seven cents per kWh,” he says.

“Onshore you’re below grid parity for conventional generation, and offshore, you’re quite close to it. So, given the fact that there’s about 20 terawatts of wind energy available across the United States, this technology has that ability to really supply massive amounts of energy.”

According to multiple news reports, Google.org has invested $15 million in Makani Power. The U.S. Department of Energy also contributed a $3 million grant for the pilot project through the department’s Advanced Research Projects Agency. “We will need more capital to support the privatizing of the technology we’ve developed and actually carrying that through to commercialization,” says Hardham.

The 30-kilowatt system has demonstrated all modes of flight — “the essential functionality of what will be needed for a commercial system,” Hardham says. The company expects to have a 600-kilowatt turbine deployed in wind farms, and potentially even offshore, within five years, says Hardham.

He says the ideal location for the company’s wind turbine is deep water offshore, although the turbine would also function well within a conventional wind farm. “Offshore
we have an even more significant mass and cost benefit, which is driven, partially again, by the reduction in materials for our system, as well as some ways in which we are able to fly it from a buoy.”

“The length of the tether scales up with system size,” he says. “We’re flying a 30-kilowatt wing right now, and that has about a 150-meter long tether. And, a 600-kilowatt wing that we’re going to start build next year will fly on a 450 meter-long tether, and the five kilowatt system that we just started thinking about flies on a 1,000 meter tether.” Adding the 600-kilowatt system will be the company’s first commercial product.

Makani Power’s wind turbine is fabricated using pre-preg carbon fiber, says Scott Parker, the company’s test mechanical engineer in charge of composite engineering. Infused fiberglass is used for the energy-absorbing parts of the wing, and landing gear, Parker says. As the turbine scales up to a commercial size, Hardham says the company will use “a bit more glass in the structure to actually address some of that cost issue.”

“I suspect that anything that reduces the cost of carbon fiber is going to help,” says Parker. “Currently we import it from the U.K., and we’re about to switch to a U.S. supplier just to get our lead times down and hopefully get a better product at the same time.”

“We do have computer-controlled builds, where you machine all the molds,” says Hardham. “We do, perhaps, some less standard things like converting an old shipping container into an oven, just to do things quickly and cost effectively. But, I think the results have been quite good,” he says, noting the wing design has passed industry tests, while also coming within specifications on weight.

Hardham says most of the work in offshore wind generation previously has been on the East Coast, “because that’s where all the shallow water is. Yet, the West Coast, with no ocean shelf, is exactly where we can prosper because we deploy a small floating buoy as opposed to a fixed-bottom type foundation.”

Jan Fletcher is a freelance writer based in Spokane, Wash. Email comments to Jan. fletcher@me.com

For more stories like this, visit compositesmanufacturingblog.com and search keyword “floating turbine.”
As manufacturers respond to consumer interest in eco-friendly products and seek ways to soften the impact of rising oil prices, organic composites are on the upswing in terms of diversity and quantity. Enticed by incentives, such as the USDA bio-preferred program as well as dreams of super-composite applications, visionaries in the composite industry are incorporating a wide range of bio materials — from crop waste to feathers, and even genetically engineered superfibers like spider silk.

The allure of arachnid silk spurs research

The idea of spider silk may conjure images of Spider Man, but the promise of stronger, more elastic fibers is driving research into genetically engineered composites. Randy Lewis, a professor of biology and spider-silk research with the Utah Science Technology and Research initiative (USTAR), in Salt Lake City, says “the reason there’s a lot of interest in spider silk is that one of the silks a spider produces has a tensile strength greater than Kevlar materials and elasticity greater than nylon.”

USTAR has developed alternative methods to produce spider silk, he says.

The Orb-weaver spider produces different kinds of silk with various mechanical properties, Lewis says. “The silk itself is a protein, so we’ve cloned the genes for each of the proteins that make up the different spider silks.” Researchers then create new genes based on those proteins and place them in bacteria, silk worms and goats, using those genetic pathways to produce engineered spider silk, he says.

“We then purified a protein, either from the bacteria, or, in the case of goats, they produced the spider-silk protein in the milk, and in the case of plants, they produced it in the leaves. So, we actually had to extract the protein, then spin fibers,” says Lewis.

With the silk worms, Lewis says researchers used a cloning kit to combine proteins, enabling the silk worms to spin the cocoons themselves to get fibers that combined super silk and spider silk.

Though still in the research phase, Lewis says researchers have already generated fibers with widely differing mechanical properties, depending upon which spider silk proteins are used. “We have ones that have very, very high elongations; we have ones that have very low elongations; we have ones that have high-tensile strengths and we have ones that have much more moderate tensile strengths,” Lewis says.

“So far scientists have not yet been able to precisely
match what spiders do with their very best silk,” Lewis
says. “We’re about half way there and we are still, in
some cases, developing ones that are better than Kevlar
materials for specific composite applications.”

So far a lot of focus has been within medical applica-
tions, such as artificial ligaments and tendons, and com-
pressive bandages, but there are other possible outcomes
of the research,” Lewis says. The team’s work has just
begun moving in the direction of composites. They are
meeting with various executives at commercial enter-
prises, who are interested in the possibilities for super
fabrics within composite applications.

“We’ve made composites with a bio-plastic that another
group in Utah is producing,” he says. “We’re making
composites of polyhydroxyuterine, and polyhydroxyval-
orate (bacterially produced plastic), combined with our
spider silk and strand fibers.” Scientists cloned the first
spider silk gene 20 years ago, says Lewis. “We’ve been
beating on this for a very long time, and we’re just now
at the point where commercialization is a probability, not
a possibility.”

Lewis says his team’s research effort will lead to new
materials within two years and depending on how the
silkworm work goes, he expects to have testing under-
way for a variety of different purposes in a year to 18
months. He is convinced that a number of different mate-
rials based on spider silk in some form or another will be
commercially available within a decade.

Light as a feather

Eastern BioPlastics, in Mt. Crawford, Va., has commer-
cialized a way to turn an underutilized byproduct of the
poultry industry — chicken feathers — into bio composite
fibre through the company’s line of Emerald resins. Sam
Carr, business development manager for the firm, says the
processed feather fibers are blended with polypropylene
and polyethylene, and the resulting composite material is
then processed into injection-mold grade pellets.

Carr says they started R&D in 2008 and began manu-
facturing in 2010, currently operating a pilot plant.
“We’re getting our process down,” Carr says, and the
company anticipates delivery of a new extruder in June
to ramp up production to 15 million pounds annually.
“It’s a little bit different from any other bio composite,
because we’re taking a waste material that has little
value and using it in a plastic product.”

The firm has a patent pending on the wash cycle used
to prepare the feathers for processing. “We’re able to
grind the feathers and then put it into plastic,” says Carr.
“We blend the feather fibers with polypropylene and
put them through an extruder, and then we pelletize it.”
According to the company’s website, the Emerald resin
is currently used in manufacturing latches, closures and
sporting goods.

Substituting feathers for fiberglass lowers the compos-
ite’s density, says Carr. “If you look at most other bio
Close-up of soy-based biopolymers developed by Biobent
Polymers.
company, Univenture, because, “they’ve always been a very friendly, eco-conscious manufacturer.” Univenture asked Masavage to test some bio composite materials. “At the beginning there were some challenges, but we helped them to improve the intellectual property, and they filed patents for it,” he says. “It’s not just a simple filler. Most bioplastics are just taking wood or some biomass with some sort of agricultural product, and just mixing it in with plastic filler. That’s an acceptable way to do it, but the problem is, when you do that, it’s pretty poor performance and often the biofeedstock they use is not particularly cheap,” he says.

Battelle has developed a protein-unfolding mechanism, which is triggered in the presence of a particular chemical during the reaction-extrusion process. “When the soy comes in contact with this chemical, it makes the protein molecule unfold. Then we introduce the resin into the compounding machine, called the twin-screw extruder, and when all of parts come together the proteins actually bond themselves to the base resin (the petroleum-based portion of the product) at a chemical level,” Masavage says.

The resulting bioplastic performs as well as the base resin. “Because we’re replacing as much as 40 percent of the petroleum in the product with a very, very inexpensive soy-based feed stock, we can actually deliver prices at or below standard prices for petroleum-based plastics,” he says. “We can now deliver the first bioplastic with comparable price and performance that meets the USDA bio-preferred guidelines.”

Biobent Polymers signed a license with the Battelle for exclusive worldwide production, sales and sublicensing of the technology. Masavage says, “We’ve got an opportunity to significantly reduce, by millions and millions of barrels, the amount of oil we have to import if we can switch to a bioplastic like this.”

Plant fiber could help auto industry shed weight

Larry C. Dickinson, Founder and CEO, of 3F, LLC, in Raleigh, N.C., developed a method to streamline the incorporation of fast-growing Kanef fibers into composites, reducing the amount of fiberglass. Kanef, a close relative to the hemp and jute botanicals, grows 12 to 15 feet tall during a three-to-four month growing season, says Dickinson. The plants’ lengthy fibers allow “all the stress carried by the fiber to be translated through the plastic to the adjoining fiber,” he says, and the fibers can be cut to length.

“You can make nice fiber-reinforced flake composites,” he says, “but they’re not that strong, especially compared to fiberglass, so why is anybody going to switch?” Yet, he says an auto industry bent on shaving pounds from vehicles to meet national goals for increasing gas mileage is proving to be a game changer for this growing niche industry.

“Right now the fiberglass composites industry is trying to get the automotive industry to make cars out of composites instead of metal,” he says. “Natural fibers are pretty strong and stiff and they are appealing compared to fiberglass, especially on a weight basis,” he says. Dickinson’s company has developed solutions for both lightening and strengthening composites. “When
While harvesting bamboo during a yearlong surfing expedition to Hawaii in 2004, two friends realized bamboo fiber could be used in the manufacturing of everyday composite products.

Jeff Goldberg, CEO of Cali Bamboo, and Tanner Haigwood, CIO of the company, returned from their Hawaiian sabbatical and went to work developing a line of bamboo products, including composites, says Walter Hicks, manager of media development for the company.

Cali Bamboo now sells a variety of wood-substitute products, says Hicks. “We are innovators in the industry. We make new products such as composite decking in addition to some of the more standard bamboo products like plywood and flooring.” Bamboo is the fastest-growing plant on the planet, Hicks says, can be harvested every three to five years, does not damage the soil, and acts much like wood composite-manufactured products.

The company also makes other non-composite bamboo products, such as mats and fencing, and the byproducts from that side of the business supply the raw material for manufacturing the company’s composites, such as BamDeck — a bio composite alternative to wood decking. The bamboo-based composite consists of 60 percent post-consumer grade, high-density polyethylene plastic, and recycled bamboo, says Hicks.

BamDeck has been on the market for two years, and “is holding up in all kinds of climates,” Hicks says. “It’s been a very impressive product. Our only problem now is spreading the word.”
Finally, there’s a fire retardant FRP with unmatched processability. It’s called Cellobond FRP and it’s processed from phenolic resins available in a wide range of viscosities for:

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Jan Fletcher is a freelance writer based in Spokane, Wash. Email comments to Jan.fletcher@me.com.

For more stories like this, visit compositesmanufacturingblog.com and search keyword “green composites.”
The composites industry is at a point of no return in terms of demand for growth, but our community lacks a shared vision for eliminating the primary barrier to that growth – namely, the time scale and cost for product-development and certification. Given the growing diversity in composites applications, it is essential that our industry accelerate the development and certification of new composite materials as well as the manufacturing and processing technology if we are to meet the growing needs of our society.

During the next quarter century, composite materials’ unique properties will benefit the civil aviation, defense, alternative energy, leisure and automotive sectors. Yet this growing demand for composite materials and technology is not consistent with the existing 12-year cycle for material and product development, certification and market delivery described by Tom Brand, retired CEO of Fiberite. Brand states that the typical prepreg product takes five years to develop and certify, followed by a typical market life of seven years; hence, a 12-year cycle. Unlike many modern industries such as electronics, the concept of “just-in-time” products is largely absent from the composites field for this reason.

Growing global impact

The significant impact of composites upon the world is evidenced many ways, including the National Academy of Engineering’s selection of composites as one of the greatest achievements of the 20th Century. Another measure is the extraordinary growth of the composites industry; carbon fiber production increased from 26 million pounds in 1998 to 49 million pounds in 2007. Current estimates project that 100 million pounds of carbon fiber will be required in the Boeing 787 Dreamliner program alone over the next 10 years.

Especially in the last 40 years, there has been enormous growth of this enterprise — from the discovery of high performance fibers to the recent introduction of the Boeing 787 Dreamliner. There have been extraordinary advances in composites technology such as: ultra-strength carbon fibers, prepregs, toughened polymer matrices, thermoplastics, automated fiber placement, out-of-autoclave systems, infusion molding, advanced textile preforms, computer-aided design tools, optimum design through part consolidation and adhesives technology.

Simulation provides acceleration

All of these advances pale in comparison, however, to the growth in computing power. Since 1970, computing power has grown from 0.001 to 100,000 million instructions per second (MIPS) and the cost of computing hardware to achieve a billion floating-point operations has dropped precipitously. The potential to utilize the trillion fold increase in computing power and efficiency is the most potent path to accelerating product and material certification, replacing the current “test and more tests” approach with an economic and effective mix of test and simulation. Using simulation to replace some fraction of experimental testing can accelerate the development of new materials, manufacturing processes and their certification by reducing both the cost and time necessary for new product development. Of course, there is a clear need for government, industry, academia and the certification agencies to rally around this idea, each with clearly articulated roles to make simulation-based certification a reality. Further, putting the power of simulation in the hands of entrepreneurs at all organizational levels, from the smallest to the largest, will unleash creative enterprises that have been restricted in the past by the availability of experimental processing facilities in developing new innovations in composites technology.

One platform that can provide broad access to simulation tools to entrepreneurs at all levels, individuals and staff in large organizations, while at the same time allowing for all to use this new approach, is the Composites Manufacturing HUB. Accessible with a Web-based browser, the Composites Manufacturing HUB is a cloud-based cooperative platform that hosts composites manufacturing simulation tools. The National Science Foundation provided the funding to develop the original HUB concept, known as nanoHUB, which focuses on nanotechnology. To date, nanoHUB boasts 10,000 users worldwide with over 350,000 simulations and 210 engineering tools to simulate important nano phenomena.
Current estimates project that **100 million pounds of carbon fiber** will be required in the Boeing 787 Dreamliner program alone over the next 10 years.

in nanoelectronics, materials science, thermal science, physics and chemistry. Over 2,500 content items, such as tutorials seminars and full classes, drive the overall community to over 175,000 users annually. The user community connects students at all levels, research professionals, faculty and industrial users. Tools range from molecular modeling and simulation to photonics. Figure 2 shows the global user community of the nanoHUB and illustrates the power of this innovative platform.

The Composites Manufacturing HUB can put composites manufacturing simulations in the hands of those who need them to invent new and innovative ways to capture the extraordinary benefits of these high performance products at an acceptable manufactured cost. “Crowd-sourcing” is the new way to drive innovation where contributions from organizations, large and small, are joined in the development of new products. The HUB provides the user with simple browser access to powerful tools that simulate the actual steps and outcome conditions of a complex manufacturing process without the need to download and maintain software in the conventional manner. Learning to use uncertainty quantification (UQ) with manufacturing simulation tools will also be accomplished on the HUB in order to allow for continuous learning and growth of the human talent required in composites manufacturing.

The Composites Manufacturing Hub provides all the functionality of the nanoHub.org and more. The Hub user community promotes broad-based innovation across all sectors of composites manufacturing. An organization or person develops an idea for manufacturing a composite component then accesses the simulation tools and data to evaluate the concepts through a virtual design and manufacturing process. The economics of the manufactured products can be evaluated and numerous scenarios studied to achieve near-optimum conditions prior to developing the actual prototype system. This avoids the expensive trial-and-error approach now so prevalent in manufacturing, and allows a much larger design space to be explored by the user. The Hub can be a clearinghouse for simulation tools developed for composites design and manufacturing.

**Power and uncertainty reduction in the process**

As an illustration, one case objective was to determine the final shape of a component fabricated of carbon fiber/epoxy unidirectional prepreg tape. A simple angle structural element is desired, but the well-known “shrinkage deformation” phenomenon resulting from thermal and chemical shrinkage of the epoxy during cure can produce a final geometry significantly different from the designed shape. The first step in the process is to design the geometry of the structural element, including the laminate lay-up, to meet the geometric constraints of the desired element. Use of software modeling provides the necessary functionality. Next, a finite-element analysis (FEA) of the structural element is carried out to satisfy stiffness and strength performance requirements. This process involves creating an FEA model using a software program. When the geometry of the structural element involves curvilinear surfaces, the conformation of the unidirectional prepreg tape to the tool surface is determined from another simulation tool.

UQ is an established methodology to predict the range in expected outcomes through simulation. It can combine simulation and experimental test results to...
reflect the actual range in expected performance and thereby assure confidence in performance with fewer tests. Today, the production of composites design variables, such as “A” and “B” allowables, is an entirely experimental task. The science of UQ is currently utilized by the National Nuclear Security Administration to certify weapons performance in the absence of testing as governed by global treaties. This body of knowledge can be transferred to the composites industry to guide the development of the new certification paradigm for composite materials and structures. Combining UQ with composites simulation tools can provide the foundation for certification of composite products with fewer physical tests.

One example of the UQ approach to determine composite performance variability is illustrated by incorporating the variability in the microstructure on failure in fiber-reinforced composite materials such as the open hole tensile strength. The uncertainty in the fiber-volume fraction is propagated to determine the uncertainty in the failure location and stress or magnitude at the onset of damage. The results in the table on page 18 show that the variability of the microstructure, in particular of the fiber-volume fraction, determines variability in failure location and load magnitude. As can be seen, the experimental and simulation results complement one another so that a smaller number of experimental results can be combined with analytical predictions of variability to achieve knowledge appropriate for certification. Other material defects, such as surface imperfections in the hole and debonded or broken fibers may be incorporated with a similar approach. Further, this framework can be used to establish variability in both performance and manufacturing results such as macro/micro geometry and resin cure variability.

In other cases, such as textile preforms and prepreg, the transformation of the planar sheet material to the curvilinear geometry requires that an analysis of the sheet forming process be carried out with yet another simulation tool. In order to determine the contribution of chemical and thermal shrinkage on the final shape and to specify the appropriate cure cycle for the specific polymer system, an analysis of the curing kinetics and resulting shrinkage is provide with cure kinetic simulation. The output of this analysis can then be fed into the original FEA tool in order to determine the final part geometry after cure shrinkage. By iterating the process, it is possible to choose an initial tool geometry that will yield the desired structural part geometry after the thermal and chemical shrinkage have occurred. Further, the UQ structure utilizes the multiple simulations to predict the variability in final part geometry and optimization-under-uncertainty tools can provide a natural pathway to minimize variability through simulation.

These examples show how design and manufacturing simulation can provide rapid and robust design and manufacture of composite materials and structures. With a broad array of simulation tools augmented by the science of UQ, the heuristic character of the manufacturing and certification of composites and the “test only” approach can be transformed into an engineering and science-based process where significant economy can be realized. The economic benefits of rapid certification of composite materials and process technologies provide the incentive for the initiation of an innovative and comprehensive partnership between industry, government and academia to establish this new paradigm. This is a vital step forward if our industry is to continue to pave the way for new developments in the field of composites as well as meeting society’s rapidly growing demand for high-performance materials. The time is now for the industry and profession to join hands and take the steps to create this new paradigm.

R. Byron Pipes is the author of more than 100 publications and currently a professor of Engineering at Purdue University. Email comments to bpipes@purdue.edu.

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The world of marketing has changed so dramatically in the past few years that it’s difficult for companies to decide what to invest in. However confusing it may seem, industry leaders are finding ways to effectively market themselves using the right tips, tools and measures. One of the biggest things they’ve learned is that the megaphone technique isn’t working—and it’s time to start using magnets.

**Megaphones and magnets**

Todd Hockenberry, owner of industrial marketing consulting firm Top Line Results in Orlando, Fla., describes the problem with current manufacturing marketing strategies as a result of “a change in buying patterns and information gathering, which hasn’t yet trickled down to enough of the manufacturing industry.” Hockenberry spent most of his life working for manufacturing companies; he even started his career developing plastic and adhesive technology for automobile doors. He suggests that manufacturers need to sell marketplace expertise by offering specific solutions to customers online.

Until approximately five years ago, companies could sneak-by with sending product brochures in the mail to new clients and get a response back. Hockenberry
refers to this type of marketing as the old “megaphone” method. He explains that print and other cold-call marketing techniques are known as “outbound strategies,” or broadcasting sales pitches to customers. In today’s market Hockenberry suggests that manufacturers practice a new marketing strategy called “inbound marketing” or drawing attention to your company by addressing customer needs.

“Buyers want to find you when they’re ready, not have your sales team bothering them and asking for orders,” says Hockenberry. “I can’t tell you how many times I’ve heard from manufacturers, ‘If we get in front of the customer, we close the sale.” Getting in front of customers is marketing not sales, and simply throwing an outside sales guy at a new customer isn’t enough anymore.”

According to Hockenberry, inbound marketing is an effective and simple way to communicate a company’s message to new customers. He believes the world needs composite manufacturers and the most effective way to market the industry is to publish more information for customers to understand material applications. “The world needs your creativity, your ideas, your products, your solutions. Create a magnet to yourself through marketing and you will never need the megaphone again.”

The inbound marketing strategy

The basic function of inbound marketing is to understand the message your company sends out in the digital marketplace. To put the size of this new marketplace into perspective, according to a Miniwatts Marketing Group study, as of December 31, 2011, there were 2.3 billion people worldwide using the Internet.

Google estimates that 97 percent of customers use the Internet to find local businesses. Forrester Research estimates that as much as 50 percent of potential sales are lost because customers can’t find the information they want online. Great marketing starts with the company’s image and how it’s broadcasting on the World Wide Web. Inbound marketing professionals believe that the best way to reach new consumers is to create unique content to match search words.

Company website optimization

Today, the path to good marketing starts with the homepage. According to Hockenberry, the most important thing you can do to improve your website is not to show that you have a good company, but that your company can solve business needs. “Writing content from a customer’s perspective will help improve your Google search results,” he says. “Include keywords on your website that customers use when talking to you, it will increase your chances of being found and gaining a customer’s interest.”

In order to increase your webpage search results, use keywords in the page content and on the back end of websites for linking and anchor text. For example, manufacturers of composite surfboards can use keywords like “strong FRP board” or “waterproof long board” to explain the product in the website. You can find valuable keywords that customers are looking for and that match your company’s products using marketing tools like Wordtracker, Google Analytics, KeywordSpy or HubSpot.

Search engines like Google use indexing software that collects information from the internet to create a usable algorithm for users to find the right information. Using good keywords on a homepage can significantly increase the company’s chances of being found by the right customers. This webpage strategy uses inbound marketing to increase search engine optimization (SEO), or organically improve your site visibility on the web through content and keywords. Additionally, unlike print adver-
tising, the digital information can be updated to change
with new customer trends and company developments.

**Promoting good content**

The next step is to update your webpage each month
by adding unique company content in the form of a
blog. “Adding new content helps address customer is-

sues and increases your chance of being found through
search terms. My customers are always afraid to start
blogging. So my advice is to write about the conversa-
tions you normally have with customers on the phone,”
says Hockenberry.

New content indicates to outside viewers that the
website is current and that the company is knowledge-
able, willing to share information and involved in cur-
rent technology. Don’t be afraid to send a quick email
or schedule a message on social media to tell your cus-
tomers about great blog posts. “SEO optimization and
inbound marketing is not something you just do once,”
says Hockenberry, “it’s part of a larger project to gener-
ate good content and make it available to customers.”

Keeping a well-organized database of customers and
keeping track of the products they want is essential to
marketing the right products for the right customers.
Composite manufacturers can use their current data-
bases, email software or even large Excel files to keep
track of customers’ needs. “Sending your customers a
quick email about a recent blog post or promotion in
their field is an excellent way to promote your website
and start a conversation,” says Hockenberry.

**Measuring the response**

The most important part about inbound strategy is the
follow-up. There are several tools like Google Analyt-
ics and HubSpot to help companies monitor website
views and other statistics. Hockenberry recommends
that manufacturers use HubSpot since all the tools are
located in one place. This limits the amount of time that
a marketing person would spend learning and analyz-
ing data on different platforms. He suggests monitoring
blog post views, number of social media followers and
site visits to see what type of content your audience
wants to read.

**Results**

Hockenberry estimates that, if done properly, the
results of inbound marketing should start to show in
30-60 days. He warns that even though many compa-

nies follow this format they don’t see results. Having an
integrated campaign that uses multiple sources to high-
light company strengths is the only way to ensure that
an inbound marketing strategy can be successful. “The
trick with inbound marketing is that it’s not a quick fix,
it’s a strategy that if done properly you’ll see huge re-

sults. Companies without a solid plan might not get that
same results.” says Hockenberry.

Those companies that have dabbled in inbound mar-
ketin know the process takes time and patience. The

**Tip from Matt Swenson:** The most important advice
for companies redesigning their websites is to map out a
strategy ahead of time. “Inevitably things come up. The
more prepared you are with a plan the more successful
you’ll be and the quicker you’ll see results.”

often disjointed process of redesigning a webpage is
only the first step in a long process. For example, Hock-
enberry started working with Manufacturing Solutions,
Inc. (MSI), an industrial equipment manufacturer in
southeast Texas. MSI had just revamped its website with
minimal SEO improvement. Hockenberry worked with
the company to develop a new image and started writing
content for the blog.

The full marketing campaign for MSI included posting
company videos, new social media pages, a new blog
site, pushing MSI staff to comment on other publications,
data mining MSI’s customer database to send emails and
postcards to the right customers, etc. Hockenberry also
used video posts to capture MSI employees completing
interesting new projects to show customers and sales
leads. As a result of these varied and consistent inbound
marketing efforts, in the past year MSI increased sales
revenues by 86 percent and saved over $1,000/month in
marketing expenses.

**New website for CCP**

American Composites Manufacturer’s Association
(ACMA) member CCP Composites in North Kansas City,
Mo., recently revamped its marketing plan after merging
with sister company Cray Valley, an international resin
and gel coat supplier. By September 2011, CCP Compos-
ites had a brand new website with modified logos to im-
prove its global presence.

“This past year we’ve focused on moving away from
printed materials and towards increasing our global pres-
ence through electronic forms and information,” says Matt
Swenson, vice president of marketing and product man-
agement at CCP Composites US. “We revamped our web-
site and we’re redesigning new literature pieces geared
towards a more technically savvy audience. We’ve also
Kreysler charters the blogosphere

Increased our online advertisements and email marketing. If we hadn’t merged and been forced to create a new look, I think this process would’ve been much slower for us.”

CCP Composites invests in a combination of marketing strategies, which include print advertisements in magazines, exhibit booths at trade shows, supplying resins and gel coats for the Lean Mean Closed Molding Machine organized by Composites One, and supporting composite manufacturing classes at CCP U. “We’re moving away from outbound marketing partly to reduce our paper waste but also because we have an in-house designer that can quickly update our digital information,” says Swenson. “I don’t have the numbers in front of me, but we’ve learned that this is the most efficient way for us to market our products and get the most bang for our buck.”

CCP Composites is still engaged in the long process of evolving into a global entity but it’s proud of the progress made in the past few months. During the remainder of 2012, the marketing department will continue to develop new content for the webpage and other digital media, like electronic product information, to engage current North American and future international customers.

Another ACMA member, Kreysler & Associates, Inc., in American Canyon, Calif., launched a blog in September 2011 to highlight composite materials in architecture. Sarah Lueck, designer at Kreysler and writer for Composites and Architecture, believes the new blog is a valuable tool for customer interchange and keeping the company abreast of industry trends.

“I don’t have a background in marketing, I’m a designer by trade. I started collaborating with Kreysler during school studio program to design custom fabricated facade prototypes,” says Lueck. “The company wanted to start a blog and I volunteered.” Lueck searches the internet and follows other engineering publications, like Architect Magazine, to find story ideas. She also created new accounts on Twitter (@compoarch) and Facebook to publish blog content and help find new story ideas. On average she spends 10 hours a week researching stories, writing, reaching out to companies, finding interesting pictures and posting them online.

Some of Composites in Architecture’s popular articles include “Treehouse FRP” and “Leap Pod-FRP Alpine Retreat”, which both use a combination of striking photos and unique composite content to grab new readers. “Most architectural publications don’t specify materials, they focus on designs and structure. Writing about composites in architecture is a unique topic we can offer the industry and tell clients about other projects that have used the material,” says Lueck.

Lueck believes she’s been successful in promoting the blog online. Her posts have been featured in other news sources, including a mention in the Architect’s Newspaper, and she’s made a number of new industry contacts for the company. She met the owner of Goetz Composites after posting a story about the redesign of the Buckminster Fuller Fly’s Eye in Miami and introduced Kreysler to a new composite architectural company.

According to the company, it’s still too early to determine how much the blog is impacting sales and new projects but Lueck believes that the blog will continue to be a focus for the company. “We appreciate all of our readers and invite people to check it out,” says Lueck.

Making sense of the magnet

Inbound marketing isn’t a scary new business investment, it’s an easy way to optimize a company’s image and keep business owners informed of marketplace trends and ideas. And it’s especially important for composite businesses since most companies are focused on marketing the material properties of a developing technology.

“The biggest obstacle for a manufacturing company is itself. There’s often nothing else keeping it from prospering,” says Hockenberry. “To grow, the composite industry must understand that marketing is an essential element of each product, and your target audiences expect you to market them well. Be confident of that fact and be in the right places (online and at events) when they look for you.”

More composite companies like MSI, CCP Composites US and Kreysler & Associates are implementing inbound marketing strategies and seeing great results. It’s evident that this new outlook on marketing is an important way to reach customers in the global marketplace with so much potential in the digital marketplace, now is the perfect time to start attracting new customers by offering solutions online.

Angie McPherson is the communications coordinator at ACMA.
Email comments to amcpherson@acmanet.org.
There’s an important and complicated “behind the scenes” story that makes ACMA’s composites advocacy successes possible. This story starts with our industry; comprised of primarily smaller entrepreneurial companies making products like rebar for bridge decks, pollution control scrubbers, corrosion-resistant storage tanks for gas stations, lightweight automotive, truck and mass-transit components, and ballistic panels.

We also employ over 250,000 people in communities all across the U.S., our industry makes a great impression on members of Congress and federal policymakers.

If you’ve been following the recent ACMA newsletters you know our advocacy program has scored some notable successes.

In December 2011 Congress ordered the Department of Health and Human Services to contract with the National Academy of Sciences (NAS) for a peer review of the 2011 listing of styrene in the Report on Carcinogens (RoC) as a result of ACMA’s efforts in coordination with its styrene industry partners. The NAS peer review, projected to finish in 2014, will serve as the basis for a repeal of the RoC styrene listing.

We’ve also worked with key House committees to support a March 22 roundtable as well as an April 25 formal hearing on the lack of good science and resulting adverse impacts associated with federal risk assessment programs like the RoC. At each event, ACMA members provided testimony, which helped focus the attention of both policymakers and media on the need for risk assessment reform.

When the inherent benefits of composite materials are combined with the willing participation of so many industry members in our advocacy programs, there’s nothing we can’t accomplish in Washington.

Paying ACMA dues is an important first step in supporting our advocacy programs but to ensure continued success we must have larger industry company participation. The Government Affairs Committee and ACMA’s Board provide direction and leadership for our advocacy program, but industry participation is the most important part of this effort.

Industry participation is what sets us apart from — and gives us an advantage over — those larger, better-funded industry groups. To actively contribute consider participating in the annual Lobby Day, taking place this year on May 17, Fly-Ins, hosting plant tours for elected officials and making a personal contribution to the ACMA PAC, or a corporate contribution to the special advocacy fund. To continue to our success we all need to make it personal.

A description of all of the important ways to contribute to our continued success is available at acmanet.org.

Dave Groner is Chair of ACMA’s Government Affairs Committee and CEO of Clarion Bathware. Email comments to dgroner@acmanet.org or call our Government Affairs staff at 703-525-0511.
Galvanized by the listing of styrene as a “reasonably anticipated” carcinogen in the 12th Report on Carcinogens (RoC) released by the Department of Health and Human Services (HHS) in mid-June of 2011, the ACMA has been working hard on Capitol Hill to advance what it views as a common sense legislative approach to overhauling federal risk assessment programs. ACMA is advocating for long-standing reform recommendations from the National Academy of Sciences (NAS) that federal agencies have not effectively adopted on their own.

Among other reform measures, ACMA is seeking greater transparency in the risk assessment process and a robust separation of science from policy, plus increased oversight of — and guidance for — programs such as RoC and EPA’s Integrated Risk Information System (IRIS).

“One of ACMA’s priorities is to help revamp the risk assessment in such a way that bad science can no longer be used to justify bad policy,” states ACMA Senior Director of Government Affairs, John Schweitzer. “We also believe the approach we are supporting would save federal tax dollars and improve risk assessment coordination by combining programs at HHS with redundant programs at EPA.”

In addition, Schweitzer says the draft legislative language ACMA has formulated would, if enacted into law, result in changes to the RoC that would bring it closer to what Congress actually intended when it first mandated the biennial report in 1978.

ACMA has presented potential reform legislative language to staffers from the House Energy and Commerce Committee and been encouraged to go forward with its reform advocacy efforts. The Association’s experience and its representation of the perspective of active small businesses has been deemed particularly valuable in this effort. ACMA has embarked on a campaign to educate lawmakers about the necessity of reforming risk assessment programs and the cost — exemplified by the negative impacts of the RoC styrene listing — of failing to do so.

One vital component of this campaign was the D.C. Fly-In on March 21, during which ACMA members visited 19 House and Senate offices. The members shared

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5 Quick Ways to Prepare for Lobby Day

Each year composite manufacturers from around the U.S. rally together to visit, advocate and educate their Congressional Representatives as part of the ACMA Composites Build America Lobby Day, taking place May 16-17. To some this is a yearly event, while for others it’s their first time. In order to help participants get the most out of this year’s visit, Composites Manufacturing put together five quick tips to help you prepare:

1. **REGISTER** for Lobby Day at acmanet.org.
2. **INVITE.** Download and send an invitation to your Member of Congress for the Congressional Composites Caucus Reception at acmanet.org/meetings. (Don’t know who your Representative is? Find out at house.gov/representatives.)
3. **EDUCATE** yourself on the composite issues that will be addressed. Information and speaking points are available at acmanet.org/meetings.
4. **PLAN.** Book a hotel and familiarize yourself with the area, including downloading a metro mobile map at wmata.com.
5. **PREPARE.** Bring business cards and a sample product for your representative.

If you are unable to make it to Washington, D.C., for the Composites Build America Lobby Day you can still make a difference in the industry’s advocacy efforts. Invite your Member of Congress to the Lobby Day reception so they can meet with your fellow composites industry professionals and ACMA staff. Also, consider participating in one of the legislative fly-ins or hosting a congressional plant tour. For more information about ACMA’s advocacy programs, contact MJ Carrabba, ACMA’s Grassroots and PAC Coordinator, at 703-682-1668 or mcarrabba@acmanet.org.
“Countries in the European Union welcome composites manufacturing because they recently looked carefully at the styrene data and determined that it’s not a carcinogen.”

-Teri Schenk, Environmental Health and Safety Manager
Global Composites, Elkhart, Ind.

information with congressional representatives about rising costs, lost job opportunities, elevated public anxieties, permitting obstacles and threats of potential litigation stemming from the styrene listing.

The following day, Teri Schenk, environmental health and safety manager at ACMA member-company Global Composites, joined representatives from other industries for a House Energy and Commerce Committee roundtable chaired by Congressman Mike Pompeo (KS-4) and attended by six other House members. She spoke eloquently about the negative impacts IRIS and the RoC styrene listing has had on Global Composites, a small company in Elkhart, Ind., employing 266 people.

According to Schenk, “Federal scientific statements are stopping businesses in the composites industry from hiring, are putting current jobs at risk and are preventing young people from being trained for jobs in the industry.”

She also argued that “as a small company, we can’t survive regulations and health warnings that are based on outdated science, on shortcuts or on undisclosed and non-transparent policy decision biased in favor of an exceedingly high-level of precaution.”

Schenk added that her company’s competitors in Mexico, China, Canada, South America and Japan don’t face these government barriers and that countries in the European Union welcome composites manufacturing “because they recently looked carefully at the styrene data and determined that it’s not a carcinogen.”

“Congress, to date, has done little to supervise IRIS and RoC,” notes Schweitzer. “These programs are also virtually untouchable by the courts. They haven’t even been subjected to effective oversight by senior officials in their respective agencies. Yet their actions, as Schenk and others told members of the Energy and Commerce Committee, have a major and often highly damaging impact.”

Schweitzer describes the risk assessment reforms ACMA is advocating as “modest” but predicts their enactment would dramatically improve the scientific quality of the IRIS and RoC programs. He also believes the association’s current proposals could provide a framework for upgrading the quality of science in other federal programs and agencies.

Carol Buckland is a staff writer at ACMA, email comments to cbuckland@acmanet.org.
Mark Your Calendar!
Jan. 29-31, 2013
Orlando, Fl

www.acmashow.org
It’s renewal season and there are a lot of reasons for ACMA members to renew—and for nonmembers to join. If your resin systems use styrene, you need no other reason. ACMA has been leading an industry-wide coalition to reform the government’s process for evaluating science and risk. Members of Congress are very interested in helping us but success in this effort will depend on our ability to generate the resources necessary to get a bill passed into law. Your membership dues will make sure we achieve success.

However, our legislative and regulatory efforts are just one aspect of the services we provide for our members. Our Composites Growth Initiative (CGI) is working on opening markets and providing business opportunities for member companies. The primary tool is the committees under the CGI umbrella that are focused on specific market segments and manufacturing processes. Those committees are working on changing codes, creating standards and developing industry marketing strategies. The CGI program also distributes leads to member companies and generates them at meetings with OEMs and potential government clients.

Another way that ACMA generates leads for our members is through our annual COMPOSITES show and other conferences. At COMPOSITES, business meetings are taking place on or near the show floor throughout the week. Many companies use the ACE Awards as a way to market their best products and gain recognition with current and potential customers.

ACMA is also your source for business intelligence and education. ACMA’s Certified Composites Technician (CCT) program is the gold standard for training and education for the shop floor. Our conferences, magazine, newsletters and statistics programs are your source for information and insights on the industry and trends that will impact your business.

Finally, business is about people. As a member of ACMA you have access to the best and the brightest in the industry—at COMPOSITES, in committees, and at Lobby Day. Whomever you need to meet, whenever you need to talk to them, you can reach them through ACMA. We encourage you to renew or send your membership application today.

Tom Dobbins, CAE

New Members
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Fibratores S.A.
La Estrella, Antioquia, Columbia
FRP Storage Solutions Co.
Orchard, Texas
International Access Corporation
Washington, D.C.
Nantong Strong World FRP
Products Co., Ltd.
Nantong, Jiangsu, China
NextEra Energy
Juno Beach, Fla.
Nobles Worldwide
Saint Croix Falls, Wis.
Purdue University
West Lafayette, Ind.
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Armidale, Okla.

New CCTs
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Aberdeen, S.D.
Mike Beverly, CCT-CM
Danville, Va.
Michelle Brown, CCT-VIP
Greensboro, N.C.
Peter Fitzgerald, CCT-CM
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Jason Lowrey, CCT-C
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Benjamin Stoddard, CCT
Bristol, R.I.
Robert Thordarson, CCT-VIP
Winnipeg, Manitoba, Canada
Taylor Tobin, CCT-VIP
Bristol, R.I.
Crystal Vanberlo, CCT
Kelowna, British Columbia, Canada
Jesus Vasquez, CCT
Caldwell, Idaho
Humberto Viana, CCT
Rockingham, N.C.
Gregory Wood, CCT-VIP
Enka, N.C.
John Wood, CCT-VIP
Hastings, Neb.
John Worrey, CCT-VIP
Windham, Maine
ACMA Architectural Division to Exhibit at American Institute of Architects

ACMA’s Architectural Division is exhibiting for the first time at the American Institute of Architects (AIA) on May 17-19, 2012, in Washington, D.C. This is an important opportunity for the industry to educate architects and engineers about the benefits of using composites in architecture. Special thanks to Best Bath Systems for supporting this outstanding outreach event. To learn more, contact Jonathan Roberts at jroberts@acmanet.org.

Corrosion Control Division End User Website is Underway

The Corrosion Control Division’s (CCD) Website Task Force has started the process of launching a new website aimed at educating engineers and end users about the importance of composites in corrosion applications. This process is expected to take three or four months. The CCD is the second Composites Growth Initiative (CGI) Committee to launch a consumer/end user website following ICPA’s lead. To learn more, contact Jonathan Roberts at jroberts@acmanet.org.
**GE Talks Wind Blade Automation**

**Steve Johnson** is the manufacturing engineering manager for GE Energy, which is one of the top three wind turbine suppliers in the world. According to the company, half of the wind turbines installed in the U.S. are GE turbines. The businesses that comprise GE Energy, which had 2011 revenues of nearly $44 billion, include GE Power & Water, GE Energy Management and GE Oil & Gas.

**Moving Swiftly from Motorsport to Production Cars**

**Clayton Triggs** is the business developer at Swift Engineering. Triggs has over 15 years of motorsport experience and has worked with multiple racing series such as IndyCar, NASCAR, American Le Mans Series and others. Triggs joined the Swift Engineering team to help the composites company increase its presence in the racing industry.

**High Performance is a Tough Sale**

**Jeffrey Kent** is president of Composite Solutions Inc. Kent has been sailing all his life. His experience working on competitive iceboats and manufacturing fiberglass spars for a major manufacturer in Bristol, R.I., motivated him to open a composites manufacturing company in the late 1990s. He is now the founder and president of Composite Solutions Inc. in Hingham, Mass., a renowned composite voice in the local marine industry.

To read the interviews with these and other leading members of the composites industry, visit www.compositesmanufacturingblog.com and click on “CM Interviews.”
Confounded COMPOSITES!

Can you name these five great American cars? How about the type of composites each uses? Test your knowledge then fill in the gaps with our coverage on page 4 of what makes these cars so important not only to American automotive history, but to the evolution of composites within this ever changing industry.

Match These Facts to the Correct Car
a. Resin-infused body panels
b. Body panels, hood, fenders, floor panels
c. SMC one-piece clamshell hood
d. Vacuum-bag carbon fiber panels (except door and roof)
e. SMC body panels and headlamp carriers

Answers: 1b, 2a, 3c, 4e, 5d