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**2008 [PART 1]
New Fabrics Showcase**

**Shade structures
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Shade and shelter, health and productivity

In the growing shade structure market, attitude is almost as important as latitude.

They say there's nothing new under the sun. In a way, that old saying holds true for the shade structure industry. The essence of providing shade has always been the same: You try to put some kind of broad, flat object between yourself and the sun. Sit under a tree, carry a parasol, pitch a tent.

But the tensioned structure revolution that occurred in the last decades of the 20th century seemed to change the rules. If we could use high-tech fabrics to create strong, lightweight structures that mimicked the shapes in nature, what else might be possible?

A complete change of perspective, that's what. Suddenly, in the 21st century, canopies and other fabric structures have become highly desirable. The most fashionable suntans come from a bottle, not a beach. People are realizing the benefits of enjoying the outdoors under shade. And as they do so, a great number of fabricators are hurrying to fulfill their desires.



Fabricators are providing communities with shade structures that act as pleasing design elements, and protect people from heat and UV rays.

The first markets to start to change were the recreational ones. Chalk it up to a hole in the ozone layer, or to the fact that the Baby Boomers were nearing retirement age. For whatever reason, suddenly it seemed that there was a quorum of people who'd had their first melanoma and didn't want to experience a second one. Manufacturers of custom boat tops stood ready to meet the demand. So did other leisure-focused companies, such as Longwood, Fla.-based SKYShades, which boasts golfer Greg Norman as a director.

"We shade the tees at driving ranges with big structures, probably 110 or 120 feet wide," says Barry Maranta, the company's president and CEO. "The structures are mobile, so that you can move them backward and forward to let the grass grow. They keep people from getting wet, too."

SKYShades has also been working for a number of hotel clients. Maranta says upscale resort properties use shade structures to entice their customers to make more use of the pool area.



Then there's the school playground market. Recent studies have suggested that childhood sun exposure may be one of the key factors in developing skin cancer as an adult. So parents are starting to take notice and to demand sun protection on playgrounds.

"We wholesale sunshade products to a couple of customers who provide them to schools," says Joe Belli, vice president of marketing at Eide Industries, Cerritos, Calif. "Obviously, from a business standpoint, if the schools are saying there is a skin cancer problem and they need shade, somebody is going to step up to the plate as a manufacturer and fill that need. Right now the sun belt gets a lot more of that type of work than the non-sun belt. But we are seeing a huge need across the board. I think that people are concerned about the children and what environment they're going to grow up in."

The U.S. government is beginning to express an interest in protecting school-age children from excessive sun exposure. In late 2006, the U.S. Department of Health and Human Services released a document called "Shade Planning for America's Schools," which outlines steps that communities can take to reduce cancer risk in students,



Parents are starting to demand sun protection for their children. Here, a SKYShades tensioned structure provides shade in an outdoor school hallway. Photo: SKYShades.

Beginning with the first quarter of this year, 41 public school sites in Arizona will benefit from solar-powered ramadas on their grounds. The shelters will provide a shady area for students and faculty to rest or work, while saving each school approximately \$500 per month on its electric bill.

teachers, staff, and visitors. Similarly, the EPA's SunWise School Program, launched in 2000, is a voluntary program that helps raise awareness about risk factors.

Shade structures at work

Will the government eventually call for shade structures at all school playgrounds? If the legislative climate in California is any indication, it's not out of the realm of possibility. After a series of heat-related on-the-job fatalities in 2005, the California Occupational Safety and Health Standards Board (CAL OSHA) adopted a heat stress prevention regulation that applies to all farm, construction, and other industrial workers in the state. The standard can be viewed at www.dir.ca.gov/Title8/3395.html.

The standard contains rules about provision of water, education, reaction to suspected heat illness, and other related issues. It also contains a specific section about shade, which says, "Employees suffering from heat illness or believing a preventative recovery period is needed, shall be provided access to an area with shade that is either open to the air or provided with ventilation or cooling for a period of no less than five minutes. Such access to shade shall be permitted at all times. Except for employers in the agricultural industry, cooling measures other than shade (e.g., use of misting machines) may be provided in lieu of shade if the employer can demonstrate that these measures are at least as effective as shade in allowing employees to cool."

"The structures need not be movable, because [access to shade] is not required to be continuous," says Tom Mitchell, senior industrial hygienist at Sacramento, Calif.-based CAL OSHA. "But where I've seen it in use, sometimes people will carry crops to a shade structure at the end of the row, and there'll be a person there doing boxing and sorting and other things."

What, then, accounts for the sudden uptick in workplace shade structures in states with no such legislation? Charles Smail, vice president of Shelter Structures Inc., Stuart, Fla., says it's the law of unintended consequences.

"We do a bunch of work in the precast concrete industry," he explains. "They make concrete in these huge molds, and they use steam to cure them. But in Michigan or Colorado in the wintertime, the exposure to the ele-

ments lengthens the cure time. It also makes it tough if the crew has got to come in in the morning and shovel snow. So we started doing completely enclosed shelters for that industry. Then we began doing a bunch of it in southern climes. The employers quickly figured out that they get more productivity out of somebody if they are not working out in the Texas or Florida sun. One of the employers down here told us that without shelter, after about six hours the productivity and the quality of the concrete finishing declined pretty rapidly. Put the workers under cover, and they can work a 10-hour shift if they have to."

Concrete sets better when a temporary shelter keeps the rain from soaking it. But the shelter also keeps workers safe and content over the course of a long work day. Photo: Shelter Structures.



Similarly, he says, Army instructors at Fort Gordon found that when sheltered by a 50-by-80-foot Shelter Structures canopy, hand-to-hand combat students were better able to pay attention and to retain what they'd learned.

Belli says some of Eide's workers grind steel outdoors under a series of gigantic canopies. It's partly to shelter them from the rain, he says, but mostly to cut the powerful California sun. Without the shade, the employees would be worn out by noon.



Car wash employees are less prone to heat exhaustion and skin cancer when their work areas are covered. Employers are finding that they're more productive, too. Photo: SKYShades.

"Most of the time, it's not because employers are trying to be nice guys," Belli says. "The owners want greater productivity."

Maranta agrees. Some of his customers are car wash owners, he says, who are trying to protect their workers from blistering UV rays. But it's not lost on them that with shade structures in place, there's less worker turnover and more cash flow. Maybe that's why SKYShades is experiencing 400 percent growth each year.

Power to the people

Until now, the majority of shade structures have been made of either vinyl-coated fabric or coated mesh. The low cost of these readily available materials has been a significant part of the sales strategy.

Smail's structures are mostly made of polyester-reinforced PVC supported by galvanized high-tensile steel tubing. Mesh picks up particulates from the air, he says, so it's generally dark-colored to hide the dirt. Meanwhile, vinyl-coated fabric sheds dirt, so it's possible to specify it in white. The lighter fabric doesn't heat up as much. It lasts longer and keeps the area underneath cooler. And, of course, it sheds rain.

Belli prefers meshes such as Coolaroo and Poly-Tex. Yes, they're permeable, he says, but they have their own advantages.

"Some of the mesh fabrics require less framing, which gets the cost down, which means they're more sellable," he says. "It's a dynamic of the fabric. It doesn't really stretch, but it has a lot of bias give. The ability to get bias rotation or bias pull on it makes it a lot more forgiving."

But now there's a new option on the horizon. Inventive entrepreneurs couldn't help noticing that the broad,

flat shape of a shade structure was remarkably similar to that of a solar collector. And, the structures were usually installed where the sun was brightest. Surely all that solar energy needn't go to waste? It would make sense to incorporate photovoltaic (PV) cells into fabric structures.

That idea is not just a pipe dream. Beginning with the first quarter of this year, 41 public school sites in Arizona will benefit from solar-powered ramadas on their grounds. The shelters will provide a shady area for students and faculty to rest or work, while saving each school approximately \$500 per month on its electric bill. They'll be powered by PV modules manufactured by Solon America in Tucson.

SKYShades is investigating similar ideas. The company is currently solidifying a deal with Konarka Technologies Inc. to commercialize the use of organic photovoltaic technology in shade structures.



Charles Smail, vice president of Shelter Structures Inc., says these shelters were purchased to protect Navy training jets from hail. But they also have a beneficial solar side effect: the cockpit temperature in summer is 80 degrees F instead of 125. Photo: Shelter Structures.



“The obvious question to ask ourselves is how we can use those roofing structures for the conversion of solar energy into clean electricity,” Maranta says. “The problem with regular solar panels is that they are worked with a mineral called polysilicon, which is in high demand. Therefore, the cost is very high. Secondly, it’s not malleable—it’s a rigid panel, which doesn’t lend itself to tensioned membrane structures. The attachment process is too difficult.”

So over the last two years, Maranta’s company has been investigating organic photovoltaic technology, in which nanotubes are used to convert solar energy into electricity. These nanotubes can be printed onto a Konarka “power plastic” film, which can then be laminated onto fabric. It’s more flexible, more lightweight, and cheaper than the alternatives. At the moment, it’s not as efficient as traditional solar panels, but research is continuing.

What’s the market for, say, an umbrella with organic photovoltaic capabilities? Almost limitless. Workers who sit underneath one during their coffee break can hook up their computers or MP3 players, or recharge their cell phones. Meanwhile, their quality of life is improved by the sun shade. Perhaps this, too, can increase worker productivity and recreational fun.

“Money is important to the younger generation of workers,” Belli says. “But it takes a back seat to other factors. These are environmentally conscious people who value their leisure time. They’re going to be interested when we say, ‘Hey, our outdoor eating patio has a sun shade to reduce the risk of skin cancer.’”

This change in attitude will play into the demand for shade structures, he says: “As an employer, if I want to attract young, bright people, I had better be thinking the same way they do. And that means quality of life.”

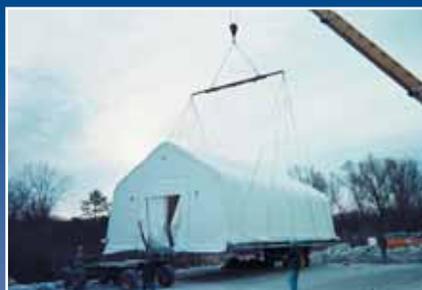
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Turn to page 78 for contact information on the sources used in this article.

Temporary Portable Buildings
Any Height - Any Length - Any Width

The Shelter Structures Solution

Sand Blasting



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Fabrication



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