

Automotive
Innovation

Going Green and Going Strong

How composites fit into the RV industry's green push

By A. Mike Shuler

As the recreational vehicle industry struggles with the economic downturn, it's finding opportunity by going green. And composite materials are staking a larger claim in the sector because of it.

"One of the biggest reasons [for going green] is that technology is advancing," says Kevin Bloom, media relations director for the Recreational Vehicle Industry Association (RVIA). "Products like solar panels or wind turbines or water filtration are more accessible to people and the costs are starting to come down to the point where manufacturers can start incorporating those things into vehicles and trailers."

Composites are included among these now more-accessible materials, comprising approximately 30 percent of the RV market, but the adoption of them on a larger scale is a relatively

recent development. "Three years ago there were no composite RVs, so it's certainly been growing in the past two-and-a-half years," says Bloom.

Bloom says the lightweight nature of composites played well into industry development. "Another factor of course is that fuel prices went up considerably. As a reaction to that, RV manufacturers began looking for ways to increase fuel economy. On the trailer side, you'll see smaller, lighter, more aerodynamic models, all of which combine to make towing a trailer more fuel efficient." Bloom added that vehicles that use more composite materials are likely to be more fuel-efficient, citing a change in maximum efficiency from 15 mpg to 20 mpg.

From Wood to Composites

EverGreen RV, Middlebury, Ind., recently introduced the Everlite trailer,

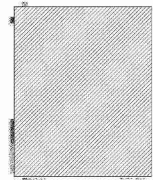
which exemplifies large-scale implementation of composites in RVs. The company claims the model is the first 100 percent composites trailer. EverGreen was formed by seasoned members of the RV industry, but this marks their first experience using composites in RV construction.

Kevin Slater, vice president of sales and one of the company's founders, used wood in his previous manufacturing efforts. "We would have a full aluminum frame and then vacuum bond the walls and floors and the roof so they end up in one piece. Traditionally, up until now anyway, we would have a layer of luan or plywood behind the high-gloss exterior or exterior skin and also behind the vinyl interior wallpaper."

Now EverGreen vacuum bonds the trailer with a material developed in-house that they call Compositex. The



Michael Setzer's Scarab RV is designed for smaller vehicles, such as motorcycles, to haul a travel trailer.



company declined to elaborate on the specific makeup of the material (other than to assure that it was made from composites) but according to its website, the materials used are not common in the RV industry, but are used in many other industries. Slater says their use of composites results in a vehicle that is approximately 1,200 pounds lighter than existing wood models of the same length.

Slater conceded that finding the materials was the company's biggest challenge. "It took a lot of time to find what we needed. Then, when we found these materials, we began testing them and discovered that during vacuum-bonding, we had to use different adhesives than we did with wood. That changed the dynamics of the manufacturing process, and the whole thing just kept moving and moving."

The drastic change in manufacturing was compelled largely by the strategy of going green, which Slater said became a noticeable development. "The driving force to go green was seen in the market a couple of years ago, and this was prior to the explosion of gas prices," he said. "We knew as an industry that lighter vehicles were becoming more of an issue with customers. As we drove toward that lighter weight, we found that the only way we could get lighter than wood was by trying various types of composites that might be out there. The need for weight reduction began the drive to change and the more we

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learned, the more we realized there were other benefits to it."

Indeed, composites proved to have more benefits than simple weight reduction. "We noticed that none of the materials had volatile organic off-gassing," said Slater. "One of those typically used in wood, formaldehyde, irritates people's eyes and has other complications as well. We knew our shell would not contain that, so it was a plus as we moved forward." Slater has a material sample immersed in water on his desk (where it has remained for several months) and remarks how impressed he is that there's been no deterioration in the materials. "In effect, we started saying it looks like we've got ourselves a construction method that's waterproof," he said.

Further tapping into customers' green minds, the company emphasizes not only the recyclability of the Everlite, but of their business practices as well. "The other thing we realized was that these materials can be, at some point in their life span if a person

so desires, chopped and recycled and used for other things like insulation," said Slater. "To recycle, as a manufacturer, is not as easy as one might think. It's sometimes hard to find people that will take certain things, and in some cases, you pay to get rid of them. But we're willing to do that, because otherwise it ends up in a landfill. So there are some challenges inherent in the service but it's important to us because it's a more eco-friendly way."

New Audiences

Another important consideration involves companies looking for both new ways to reach their audience and new audiences to reach. Michael Setzer, an independent manufacturer based in Camano Island, Washington, has developed an innovation with the latter idea in mind.

He is designing and developing the Scarab RV, a lightweight tent trailer. Though its eye-popping feature is a linear actuator-enhanced self-compressor, the composites body is of great importance. "I decided early on that the best way to use composites is to build it the same way that the new LiteSport aircraft is built, which utilizes a light steel frame and a light composite body that encloses it and gives it some good aerodynamic and aesthetic qualities." The construction of the panels is pressure-molded fiberglass with a gel-coat finish.

Setzer had some experience working with composites in repairs and small boats, but tackling a project of this scale presented a new set of chal-



EverGreen RV says the Everlite trailer is the first RV made entirely of composite materials.

lenges. "Initially, the whole body was carved out of foam," he said. "That's how the plug mold was made and I did that in a fairly conventional way that has been done over the years in building airplanes." During the process, Setzer discovered a different way of manufacturing, which he will use in the final production. It involves CMC machining of the foam core treated with a core-tron material which becomes the plug mold.

What the product will do, Setzer said, is bring a new audience to the market. "The Scarab is going to be oriented more towards younger individuals who want to travel, who are cost conscious, energy conscious and adventurous, whether that's a young single adventurer or a new family with young kids!"

Setzer said tent trailers made of traditional materials such as plywood and metal have a dry weight of, at a minimum, 1,000 pounds. While that isn't much of a burden on pickup or SUV drivers, it represents an impasse for cyclists and smaller-vehicle drivers (Toyota, for example, specifically states drivers of their Prius hybrid cannot pull a tent trailer.) In contrast, the Scarab has a dry weight of 215 pounds. "That's substantial numbers as far as I'm concerned," said Setzer. "I know my Prius isn't something I would want pulling a ton of weight behind me. But when you're talking about something that weighs about what I, as a second passenger would weigh, isn't very significant."

Setzer thinks there is a large potential crossover in who the product will reach, including a greener audience. "I think ultimately the economically-conscious, green drivers are interested in having this kind of tent trailer they can take out, still get 45 miles to the gallon and have the convenience of not having to pull into a hotel every night if they're out travelling."

Time will tell if the RV industry's green push will be a passing fad or lead to permanent changes. But with green-related issues such as fuel economy becoming a higher priority in all automotive sectors, vehicles such as Everlite and Scarab are showcasing

how composite materials can be used smartly to meet these changes.

For more RV and automotive stories, turn to page 6.



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