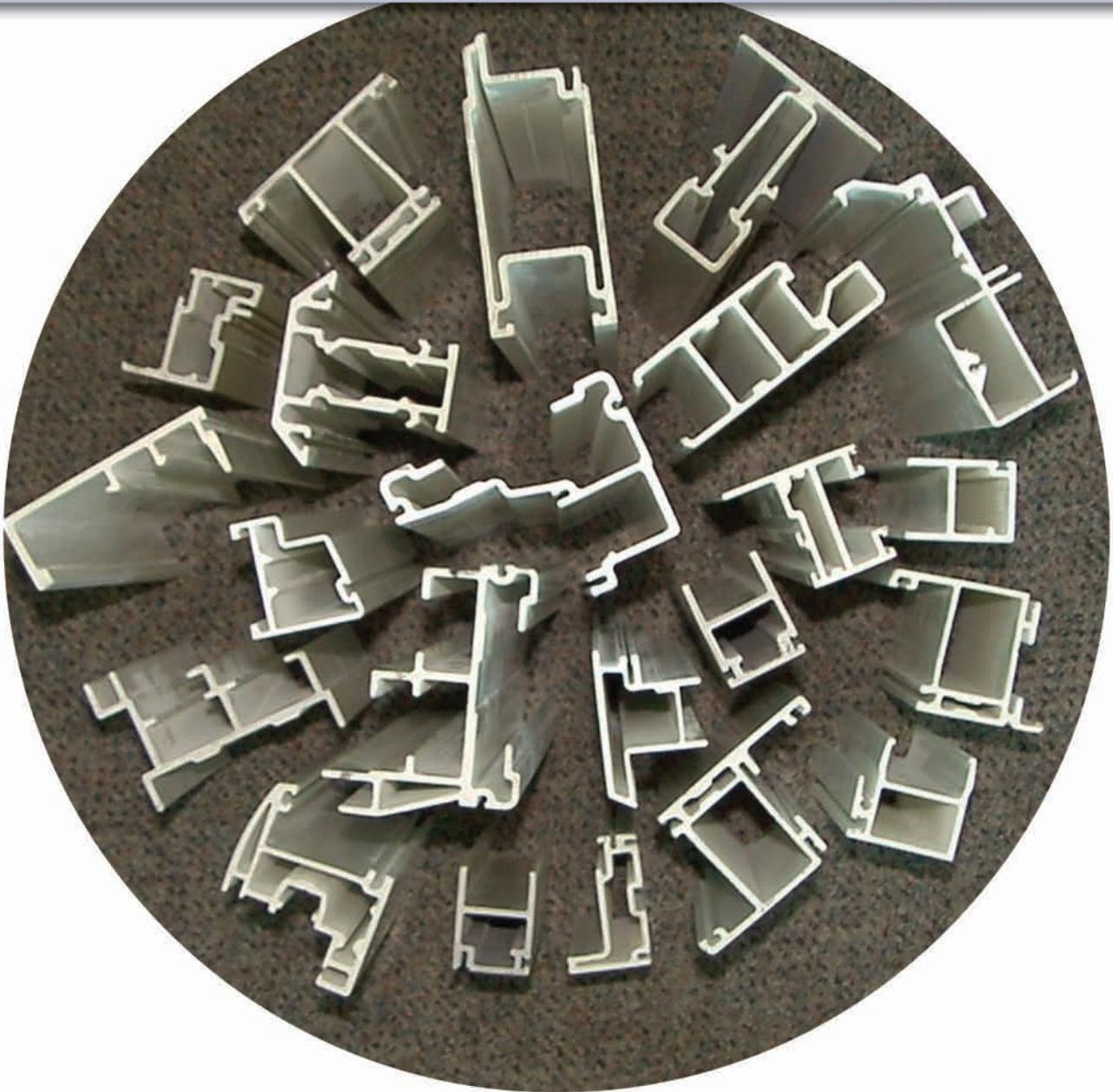


The Idea That Changed an



Omniglass brings composites to complex window lineals

By Margie Church, Editor

Most of us have had at least one brilliant idea that we figured would change the world and make us famous. The majority of those half-baked ideas die before we pull them out of the oven, but Lawrence “Laurie” Davies’ wouldn’t give up on his big idea to pultrude window lineals. Although pultruders around North America thought Davies’ idea was not technically possible, Davies was certain it was. With persistence, Davies overcame objections at many of the

most renowned window and door manufacturers, and eventually his brilliant idea changed the fenestration business.

Persistence overcame the skeptics

Davies co-owned a window and door company in Winnipeg, Manitoba, during the 1970s. His company was building window lineals primarily with aluminum, wood, and vinyl, and Davies understood the

Industry

shortcomings of each. He was also familiar with the work of W. Brandt Goldsworthy, the composites and plastics industry pioneer who had also founded the world's first pultrusion manufacturing plant. Davies was quick to connect the dots.

"Laurie kept asking himself, 'Why can't composites be used in window lineals?'" says Don Keatch, Chief Operating Officer for Omniglass Ltd. Davies was never one to give up easily. He took his window frame drawings and traveled all over North America to convince just one pultruder to help him develop his idea. "The pultruders Laurie met all said he was nuts," Keatch says, "but he wasn't ready to quit just yet."

One can't ignore the fact that nearly 30 years ago, fiberglass reinforced plastic (FRP) was still in its infancy in many applications. At the time, pultrusion was only being used for simple geometric shapes, primarily in structural reinforcement applications. What



Glass strands are being organized prior to entering the pultrusion die.

Davies was proposing was a complex shape in an untried application. It's no wonder he was met with skepticism and resistance.

Davies' rejections eventually took him all the way back to his own stomping grounds in Manitoba, to a small town named Gimli. In this lakeside resort town along Lake Manitoba,

Originally published in Delivering Performance Winter 2008.

Reprint permission granted by QuestCorp Media Group, Inc. www.qcmedia.com



Many Omniglass customers don't realize how much fiberglass is in a typical lineal. When they see an example such as this, they often wonder how it is possible.

he met a man who was making pultruded rods for hog farm fencing and pultruded box beams. "The fellow was using FRP because it was the only material that pigs wouldn't eat," Keatch says with a chuckle. "Laurie used to say FRP stood for 'Fiber Resistant Pigs!'"

Finally Davies had found a "can-do" guy like himself, willing to take a chance on a great idea. After three years in development, in 1983 they started pultruding their first lineals and Davies formed Omniglass Ltd. to market and sell their products.

FRP beats wood, aluminum, PVC

Stability, strength, and one-piece construction are alluring Omniglass product benefits. Once the first lineals were produced, Davies' challenge really was

to demonstrate that they could successfully replace wood, aluminum and PVC (polyvinyl chloride) lineals. PVC's European equivalent is uPVC (unplasticized polyvinyl chloride).

Keatch says the company did extensive testing to learn the physical capabilities of their products. Flexural testing established



how strong their pultruded shapes were longitudinally and transversally. Impact resistance, thermal expansion/contraction, and heat distortion properties were all examined and documented. Test coupons were further evaluated for osmotic resistance and put through freeze/thaw cycles to learn more fully how their products would perform in real-world and extreme environments.

FRP is thermally stable, so it won't bend, twist, or buckle as temperatures change. Wood and aluminum certainly aren't thermally stable. PVC, which still claims half the window lineal market share, isn't either. PVC also is not structurally stable; it degrades over time. Yet PVC remains extremely popular because it is inexpensive, relatively durable, and easy to process.

The FRP matrix Omniglass uses for its lineals and sills has excellent structural properties that remain stable over time. Its thermal performance is superior to wood and PVC and far exceeds that of aluminum. ►

And of course, FRP doesn't absorb moisture and will not mold, rot, or warp like wood can. It also won't expand or contract in extreme temperatures causing sealed unit failures and energy loss. Omniglass provides a warranty on its substrates but has never had a field warranty claim.

FRP is a lightweight, high performance material that opens up opportunities to combine

"Laurie's goals were always to achieve more complex shapes with thinner walls. Omniglass suppliers and partners have helped us reach those goals."

Omniglass has continually evaluated every aspect of its systems, including tooling design, resin and glass selection, forming methodology, and line speed. Its material matrix consists of roving and continuous

shapes. Omniglass' typical pultrusion line speeds are competitive in the industry, but Keatch acknowledges that improving line speed is a constant challenge to reduce costs and increase value for customers.

"We've had some brilliant failures," Keatch says, "but we've learned from them and continue to evolve our products and processes. That's how we earned our reputation for being innovative."

"Laurie kept asking himself, 'Why can't composites be used in window lineals?' ... The pultruders Laurie met all said he was nuts."

— DON KEATCH, CHIEF OPERATING OFFICER FOR OMNIGLASS

thin walls with high structural performance. Its fundamental challenge remains its cost.

Stronger, lighter, more complex shapes

"Our staff has worked with our various materials and technology suppliers to help evolve our products over the years," Keatch says.

strand mat with a binder that results in a high glass loading. The roving provides high longitudinal stiffness, and the mat gives transverse stiffness. The fiberglass mat tends to be a constraint for line speed, so Omniglass has worked with its suppliers to optimize a mat suitable for its process and complex

Davies' door and window company started using the FRP lineals soon after the first shapes were successfully pultruded. In those early days, Keatch says, it was a hard sell to convince window and door manufacturers that this new material merited their consideration and investment. For the next decade, Omniglass representatives educated interested manufacturers about the products. In addition to sales calls, Omniglass created an industry presence by attending and eventually exhibiting at window and door shows in Canada and the U.S. It also joined the American Architectural Manufacturers Association (AAMA) and the Window and Door Manufacturers Association (WDMA).

"And then finally the industry understood," Keatch says. "Marvin Windows and Doors made a bold move to commit to it [pultruded lineals] early on. Their leadership saw the opportunity and the vision." Marvin strongly supported and promoted the material over the years, and today, it is a large and prominent manufacturer of FRP lineals.

Omniglass seeks and receives inquiries from top brass to engineering technicians and everyone in between. Keatch says their response to every company inquiry seems to be unique. Some of Omniglass' greatest successes have been window and door company owners who became fascinated with the unique properties of FRP.



An office building in Riyadh, Saudi Arabia, utilizes the world's first curtain wall system, which secures the glass panels to the exterior of the building.

“The companies that have signed on to use our lineals and door sills have done so because their leadership understood that our products improve what they are already doing,” Keatch explains. “They know that using our products will eventually improve their market share by providing access to new markets opportunities.”

While cost remains an issue, it did not deter those companies that are serious about staying in the business and being known as leaders. Most of the largest window manufacturers are now using fiberglass lineals in their product line. Several of them also became licensees in order to manufacture the Omniglass products themselves.

Created an entirely new category

Keatch is excited about Omniglass' future, and with good reason. The company completed an expansion three years ago that doubled its size. Its pultrusion equipment is state-of-the-art, and Keatch describes its 55,000 square-foot manufacturing facility as “environmentally top drawer.”

The company produces several million linear feet annually and expects a 30 percent increase in 2008. Keatch says the company will continue to grow by taking share from markets using traditional materials. Licenses for Omniglass technology have also expanded to Europe, Asia, and the Middle East.

Keatch says the company has developed a process to apply acrylic capstock over pultruded parts for applications demanding great resistance to scratching and scuffing. The process takes place in line with the pultrusion, providing high performance

Originally published in Delivering Performance Winter 2008.

Reprint permission granted by QuestCorp Media Group, Inc. www.qcmedia.com

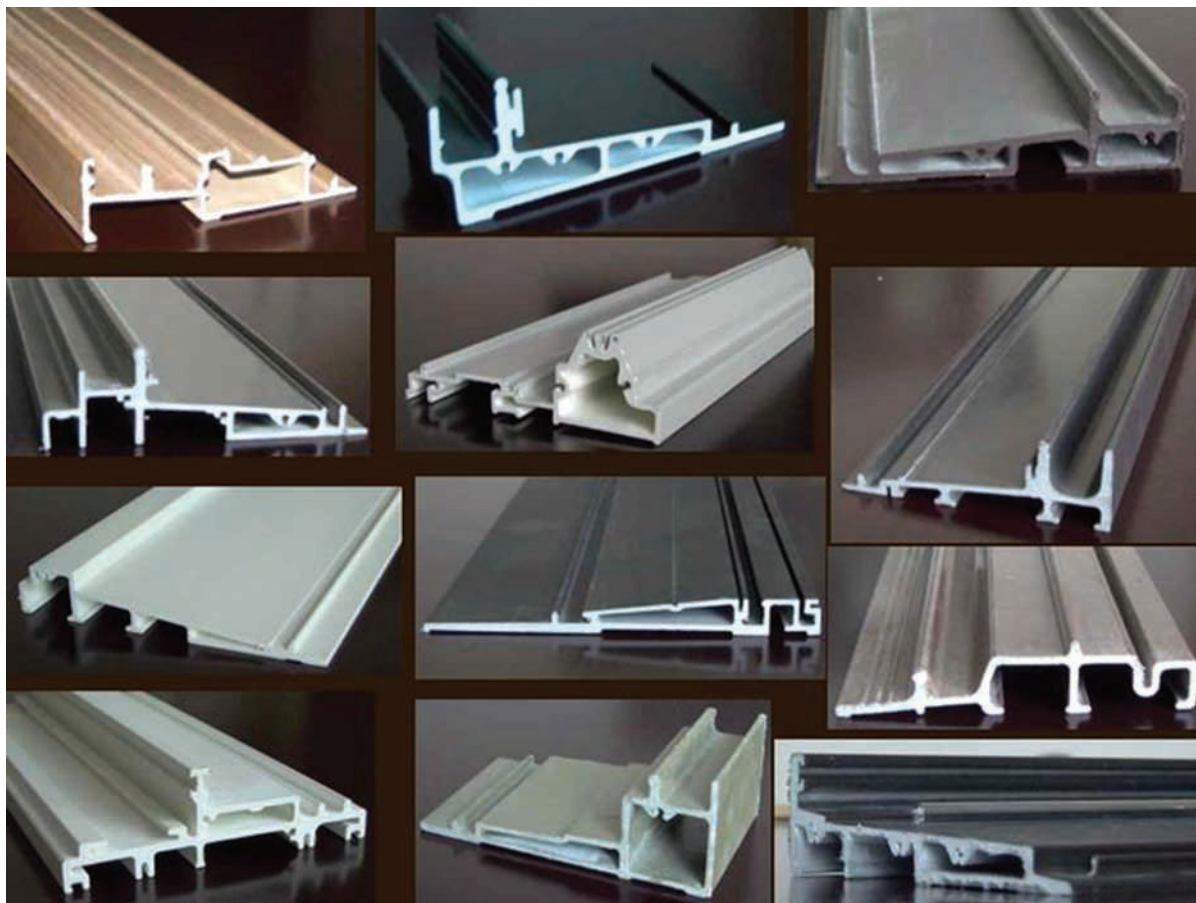
Two years ago, the American Architectural Manufacturers Association (AAMA) created a new category: FRP. This categorization signified that FRP had finally achieved recognition as a major player in the industry.

at a reasonable cost. Deck railings are a typical application.

Omniglass also continues to pursue the commercial window market. That market has been dominated by the aluminum industry for very good reasons. Aluminum has a proven

shift as the material's potential is more fully understood. “We can make a big impact in that market,” he concludes.

For years, FRP was listed as “other” materials in window and door surveys. Two years ago, the American Architectural Manufacturers



track record for strength and durability, and the design and fabrication techniques are well understood. However, with the increased emphasis on energy efficiency and the environment, the opportunity for FRP to play a significant role in this industry can only increase. Keatch already knows that FRP is a viable alternative material for commercial fenestration and predicts a gradual market

Association (AAMA) created a new category: FRP. This categorization signified that FRP had finally achieved recognition as a major player in the industry. It is the first new material to be acknowledged by the industry in more than 30 years.

There is indeed a bright future for Laurie Davies' brilliant idea. **N·C**