

technology TODAY

Alan Pierce
pierceaj@optonline.net

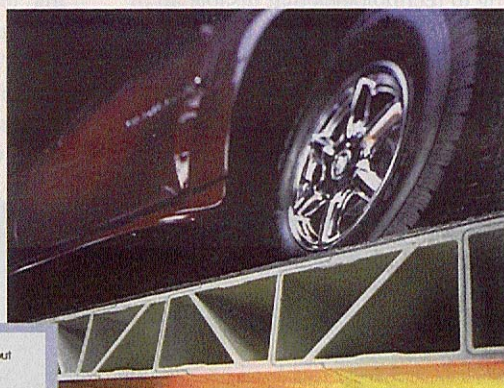
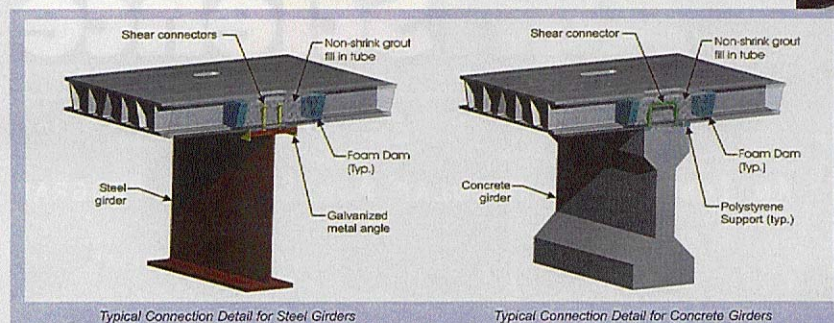
Polymeric Polyurethane Bridges

Choosing a subject for each month's column isn't as easy as you might think. New technologies are always emerging, and deciding which one to write about often proves a difficult task. This month's topic came to me at this year's International Technology Education Association conference in Nashville, TN. I was part of a small group of conference attendees engaged in a conversation about predicting the future of technology. Liz Myhre presented a famous quote from the 1967 movie *The Graduate*. If you know the movie, you might

fiber-reinforced polymer (FRP). Martin Marietta Composites, through an alliance with Creative Pultrusions, Inc., of Alum Banks, PA, has successfully produced and installed DuraSpan on bridges in Oregon, South Carolina, North Carolina, New York, Pennsylvania, Illinois, Iowa, and South Korea.

DuraSpan is definitely a space-age material. Engineers at Lockheed Martin's Missiles and Space Division in its Palo Alto Research & Development Laboratory originally developed it. They intended it for use in aerospace structures and space transportation systems.

Engineers and contractors say that DuraSpan has many advantages over conventional bridge decking materials. The high-strength composite resists both structural fatigue and corrosion. The relatively lightweight sections are easy to transport from a manufacturing facility to a construction site. DuraSpan decks have already been installed on steel and concrete girders as well as on the new polymeric girders starting to find their way into new construction. The bottom photo shows workers installing a DuraSpan deck on a bridge. You can learn more about



DuraSpan on the internet by typing the key words "DuraSpan" or "pultrusion" into a search engine.

Recalling the Facts

1. Why would a DuraSpan deck be

remember the scene where Dustin Hoffman is told he needs to give direction to his future, and that there was a great future in plastics.

The simple truth is that there is still a great future in plastics. Today, people can create myriad composite materials by combining a polymer matrix with fillers, additives, and reinforcement agents such as carbon fibers, Kevlar, and glass. The strength, weight, and corrosion resistance of these materials permit their use in unusual places.

Have you driven across a polymeric polyurethane bridge lately?

The top righthand photo shows a car on a fiber-reinforced polymer bridge decking called DuraSpan™. A Raleigh, NC, subsidiary of Martin Marietta Materials manufactures this

DuraSpan ingredients are combined using a pultrusion process that forces reinforced thermoset resins through a series of heated shaping dies and resin baths. The polymer composite combines glass and carbon fibers in a polymeric matrix in which all of the ingredients keep their individuality but create a synergistic relationship that produces a whole that is definitely greater than the sum of its parts. The panels are assembled using polyurethane adhesive into 8- and 10-foot-wide decks for easy shipping.



superior to a bridge deck made of concrete, steel, or wood?

2. What aerospace company originally developed DuraSpan? What was its intended use? **te**

Alan Pierce, Ed.D., CSIT, is a technology education consultant, technical writer, and public speaker on technology issues.