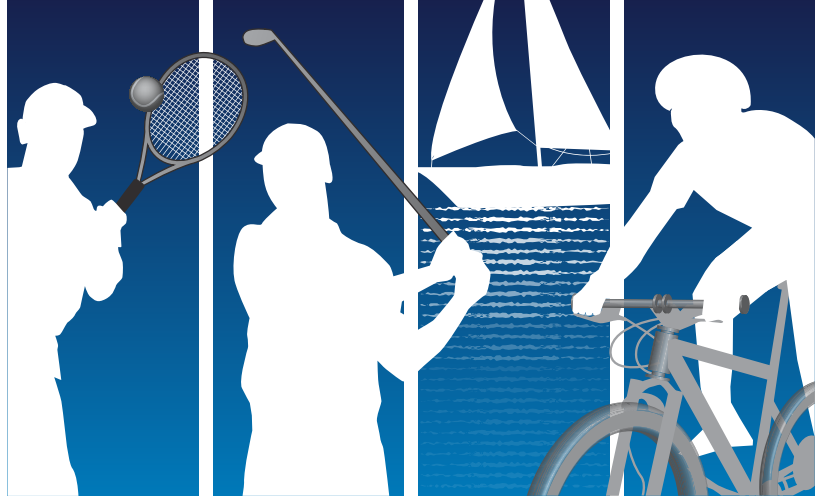




Composites in the Bicycling Industry

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*The following is an excerpt of a published paper that originally appeared in 1988, for the **Society of Manufacturing Engineers**. This paper was presented on November 1-2, 1988 at Hyatt Islandia in San Diego, California. Topics include Composite Materials for Bicycle Construction, Advantages of Composites, and Manufacturing. Written by Andrew H. Tudor, Manager, Research and Development for Schwinn Bicycle Company, Chicago, Illinois.*



Advantages of Composites

Laminated composite materials have found application in high performance structures where added performance had priority over economic considerations. With the cost of higher modulus and strength materials coming down, the possibility now exists for the bicycle industry to adopt this new class of materials for bicycle application.....

Composite Materials for Bicycle Construction

The primary fibers in the industry are glass, graphite and aramid fibers. It is doubtful that glass epoxy or Kevlar® epoxy can be used entirely in the bicycle frame. This is mainly due to their lower modulus. However, this does not preclude these materials from being used in other areas of the frame where their characteristics would be desirable. Kevlar® can be used for abrasion or impact resistance (shock absorption), while glass can be used as an inner layer for its insulating properties and as a sacrificial layer for final machining operations.

Manufacturing

In the manufacture of high-performance bicycles, the product needs to be designed to the constraints of high speed manufacturing systems to minimize costs. The net result is to produce large numbers of high quality bicycles for the lowest cost. The plant layout needs to be organized and structured efficiently in order for the materials to flow continuously. The tube life, mold maintenance and machining are essential to ensure reliable, durable tooling for long production runs. The tube manufacturing process....

For more information on the complete paper discussing composite/bicycle technology, as well as composite materials for other sports and recreational activities, contact us at **Meridian One, Inc.**