



## **Advanced Materials & Processes November 2006**

### **Low-Cost Composite Pultrusion Method Reduces Costs by 90%**

A simple low-tech pultrusion technique is now being adapted to lend its simplicity, efficiency and cost savings to production of complex composite structures for high-performance military and commercial hardware, says KaZaK Composites, Woburn, Mass.

The pultrusion process is completely automated; it starts with spools of dry fiber and/or fabric reinforcement, adds wet resin, then moves the material through a heated tool. The result is a continuously produced stream of low-cost, constant cross-section composite hardware that can be cut automatically to length at the end of the processing line. The pultruded composites can be reinforced with many fibers such as Kevlar, fiberglass or carbon.

KaZaK developed and advanced the technique with MDA Phase I and II SBIRs investigating strong, cost-effective carbon/epoxy missile canisters for the PAC-3 program, specifically to make very straight, large cross-section (up to 20 feet long) boxes. KaZaK has also built larger “superscale” pultrusion machines, including the world’s widest pultrusion equipment, optimized for making composite sandwich panels greater than ten feet wide and of unlimited length.

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