



DPA Title III's Rigid Rod Polymers Replace Some Defense Metal and Composites



Rigid Rod Polymer Components

The Defense Production Act (DPA) Title III program has enabled domestic research and production of new rigid rod polymers, replacing some metals and composites in military and medical applications.

Rigid rod polymers get their name from long, stiff molecules that reinforce each other. They are strong, flame-resistant, durable and easily machined. Defense, industry, and universities have long pursued rigid rod polymers as replacements for metals and composites. However, they were difficult to melt and mold, so applications were limited.

Six years ago, the DPA Title III program, which ensures domestic production of critical defense technologies, partnered with a Georgia-based, polymer company. This partnership helped move rigid rod polymers from the lab, into more affordable production by improving material quality, manufacturing, production costs, and helping to establish a manufacturing facility.



Machining Rigid Rod Material

Since, the company has produced the rigid rod polymer, PrimoSpire, with a tensile strength of 30,000 psi. It was bought by a supplier of plastic shapes, and according to the supplier, this rigid rod polymer has found its way into defense applications. Its strength and lightweight make it attractive for parts on military aircraft, including everything from electronics housings to fasteners. It is also in fixation devices for orthopedic surgery (picture right) because of its lightweight and x-ray transparency.



This partnership recently developed a new Generation II rigid rod polymer with improved consistency, color stability, and reduced sensitivity to melt-processing. Work on Generation II will continue in 2008 to better ensure commercial success.

Rigid polymers offer even more uses. One application for the Navy's SeaRam Missile blast shield has been qualified and other uses are in developmental and testing.

For more information on the DPA Title III program, visit www.acq.osd.mil/ott/dpatitle3/.