

Polymer enhances aircraft seat safety

by VICTREX USA Inc.

FERONYL, a Belgium-based manufacturer of seats for both military and commercial aircraft, chose VICTREX PEEK™ polymer to replace a magnesium alloy in a variety of seat components.

"PEEK meets the key requirements for outstanding mechanical strength and low flammability/low toxicity requirements in fire situations while delivering lower part weights than metal," explains Chris Karas, general manager for Victrex Americas. "Seats in aircraft manufactured by companies such as Airbus, Eurocopter and Mirage have become complex assemblies. In addition to offering maximum comfort for passengers and crew, they must also provide long-term functional safety and passenger protection."

Karas says, "An aircraft seat consists of numerous components that have traditionally been made from a magnesium alloy. However, crash tests have revealed that this material does not consistently ensure optimum elasticity. The lumbar support adjuster, for example, can show a permanent deflection after an impact without springing back as required."

To provide the necessary long-term strength as well as creep and fatigue resistance, FERONYL chose a carbon fiber reinforced PEEK to mold both the lumbar support adjuster and the headrest. Because both the headrest holder and the seat belt guides do not require the same high level of mechanical strength and stiffness, FERONYL chose a glass reinforced grade of PEEK polymer.

In addition to providing superior mechanical performance in compliance with industry's crash performance standards, seat components must also satisfy fire, smoke and toxicity requirements. "PEEK polymer has a UL-94 V-O flammability rating," says Karas. "Plus, it is an inherently pure material which results in extremely low smoke and toxic gas emissions in fire situations. This performance advantage can significantly raise the chances of survival for passengers and crew in the event of a fire."

Military specifications

Complying to military specifications for this and other related applications is critical. According to John Walling, Victrex military industry specialist, there are two types of military specifications that may help to streamline the qualification process for components made from plastic materials.

First, military material standards serve to classify polymers based on their chemistry. For example, MIL-P-46183 covers Plastic Molding and Extrusion Material, Polyetheretherketone (PEEK). These specifications set allowable ranges for physical properties so engineers may design to the listed values without repeating basic standardized tests each time they specify PEEK.

Second, military detail standards provide specific instructions including allowable materials used in common parts such as connectors or fasteners. Therefore, they may actually state which resin types may be used and then refer to the appropriate military material standard for reference.

Walling says, "In general, military specifications help engineers avoid repeated



Enhanced aircraft seat safety with VICTREX® PEEK™ polymer. The polymer's inherent high performance, combined with consistent ease of processing, has made it the material of choice for these state-of-the-art aircraft seat components.

tests and time-consuming material selection exercises leading to faster development cycles." ■

VICTREX USA Inc., a division of Victrex plc, is the sole manufacturer and supplier of VICTREX® PEEK™ worldwide. For more details on the properties and performance advantages of VICTREX PEEK, call (800) VICTREX or visit www.victrex.com.

IMPORTANT INFORMATION FOR EMPLOYERS WHO PAY EMPLOYEES SALARY WHILE ON MILITARY DUTY

If you are an employer who continues to pay an employee full salary or the difference between his or her salary and the amounts received from the military, be aware that the employment relationship between the employee and the company was terminated when the worker was called for active military service with the U.S. Government or for active service with the state National Guard.

Under the circumstances, the payments made by the company to the former employees while they are in military service with the U.S. Government or active service with the state National Guard are not "wages" for services performed in "employment" for the companies. These payments, therefore, are not "wages" subject to the taxes imposed by the Federal Insurance Contributions Act and the Federal Unemployment Tax Act or to the Collection of Income Tax at Source on Wages. Note, however, these payments are includable to the taxpayer as income. Businesses are required to issue a Form 1099 *Miscellaneous* for any amounts paid.

For further information on this topic, access the IRS web site at www.irs.gov/newsroom/article/0,,id=112695,00.html.