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## **Investigation of the effect of TiO<sub>2</sub> on the thermal, mechanical and erosive properties of aviation thermoplastic composites**

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The main goal of this study is to analyze the effect of increasing the amount of titanium dioxide (TiO<sub>2</sub>) particle filler in polyetherimide (PEI) thermoplastic composite materials, which are widely used in automotive and aircraft components. TiO<sub>2</sub> generally improves the stiffness of the materials but reduces their erosion resistance, and filler concentration beyond 10 % impairs the bending strength. In the present study, variation of the bending, thermal, and solid-particle erosive wear properties of TiO<sub>2</sub>-reinforced PEI thermoplastic composites were investigated by changing the amount of TiO<sub>2</sub> filler. The results confirmed that higher filler concentrations improved the bending strength of the composite structure, but decreased their erosion resistance. It was also found that the bending properties of the thermoplastic composite samples eroded at a 90 degree impingement angle remained nearly equal to those of the uneroded samples, whereas they were significantly reduced at a 30 degree impingement angle. We also determined the thermal stability of the composites using thermogravimetric analysis (TGA) methods.

### **Biography**

Fuat Okumuş has completed his PhD in 1997 from Fırat University in Turkey. He has been a Full Professor in 2010. He has published more than 22 papers in reputed journals and conducted three projects which were supported by TÜBİTAK (Turkey Science and Technology Association). He has been performing the main courses of machine engineering such as strength, statics, failure analysis, composite materials, mechanics of composite materials, project managements. He is still in-charge as the Director of Department of the Machine Engineering at The Gediz University.

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