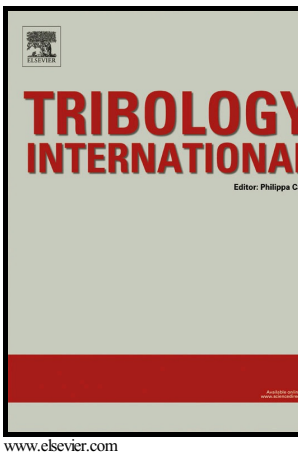

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Determination of Solid Particle Erosion with Taguchi Optimization Approach of Hybrid Composite Systems

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ABSTRACT

This empirical study investigates the solid particle erosion wear behavior of a new composite material made of glass fiber and epoxy as the main materials and (Al_2O_3+SiO_2) particulates added into the structure at the amount of 30% [15% (Al_2O_3) + 15% (SiO_2)] of the resin used for the composite. The tests were carried out by selecting three different impact velocities (23, 34, 53 m/s), three different impingement angles (30°, 60°, 90°) and angular alumina erodents having approximate sizes of 200 μm. The fiber directions were used 0/90/0, 45/-45/45 and 90/0/90. An erosion test facility at room temperature and Taguchi's orthogonal arrays were used for experimentation. Moreover, an optimal parameter combination was determined, which led to minimization of erosion rate (ER).

KEYWORDS: Solid Erosion; Epoxy; Particulates; Impact.

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