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Investigation of Tribo- Mechanical Properties of Fly ash with E-Glass Fiber Reinforced AL MMC's.

[1]Mr. Ishwar D Phapale, [2]Prof. B. M. Randhavan' [3]Prof. P. B. Dengale
[1,2,] Department of Mechanical Engineering
Sahyadri Valley College of Engineering & Technology, Rajuri, Pune

Abstract: *Many of the engineering applications in the world today require materials with unusual combination of properties that cannot be met by the conventional metal alloys, ceramics or polymers. Composite materials have been increasingly used in aerospace and automotive applications over the last three decades and even usage increase in non-aerospace products in the recent few years. Hybrid composite materials having outstanding strength, stiffness, and lightweight properties and the ability to tailor the stiffness and strength to specific design load among the various aluminum series. Here the base alloy as Al2024 shows low strength and corrosion resistance as compared with other alloy series. AMC's specimen made by liquid stir casting technique, by addition of fixed 3% E-glass fibers and fly ash particles in different proportions (4, 6 and 8 wt.%) prepared the matrix phase.*

The test specimens are prepared as per ASTM standard size by turning and facing operations to conduct mechanical testing like hardness and tensile & compression tests. From these test the composites shows better improvement in hardness, tensile and compression strength. The composite shows better mechanical properties than the base alloy. Dry

sliding wear behavior of the aluminum alloy and the composites has been studied and tested using a pin-on-disc wear and friction monitor. The testing carried out on sliding velocity of 1.5, 2.5 and 3.5 m/s and load ranges from 1, 2 and 3kgf. Abrasive wear resistance improves by addition of fly ash reinforcement. By E-Glass and Fly ash reinforced into base alloy showed a much lower rate of wear when compare to unreinforced matrix alloys for loads.

Using Taguchi method, an Orthogonal Array (OA) is considered to reduce the number of experiments required to determine the optical wear for Al/EG/Fly ash Metal matrix composites. Results shows the signal to noise ratio for wear rate shows the better wear resistance with increase in fly ash contents. Analysis of variance shows small error i.e. % contribution factor of error is smaller. Confirmation test is verified for optimal level.

Keywords: ASTM standard

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