"Analyzing the bearing properties by using composite materials"

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Abstract - This Study assesses the impact of autonomous parameters, for example, typical load(A), sliding distance(B), velocity(C), filler content (D) on wear execution of Molybdenum Disulphide (MoS2) strengthened with Polytetrafluoroethylene (PTFE) composites utilizing a measurable approach. Dry sliding wear tests is to lead utilizing a standard Pin on circle test setup following an all around arranged exploratory to limit the wear rate were resolved. It was discovered that the incorporation of MoS2 has significantly enhanced the wear obstruction property of the composites. Sliding separation (B) was observed to be the most critical factor influencing the wear rate took after by typical load (A), while filler content (D) if there should be an occurrence of Coefficient of contact.

Keywords:Composites, PTFE, MoS2, Coefficient of friction, Wear rate, Pin on disc tribometer.

I. INTRODUCTION

Bearing materials are extraordinary sort of materials, which convey a moving or pivoting part with slightest erosion or wear. One of the vital troubles in building up a decent bearing material is that the two essentially clashing necessities are to be fulfilled by a decent bearing material. The material must be delicate with to a great degree low shear quality and also it must be sufficiently solid to help substantial dynamic burdens. This is for the most part accomplished either by having an orientation material with a metallurgical structure innately fusing both hard and delicate constituents.

In an extensive number of general designing practices where greasing up conditions are moderately poor and administration conditions are not exceptionally demanding, thick strong course are utilized with a duplex structure. The kind of bearing relies upon the heap, speed and the working conditions in which it is to be utilized.

Thus, because of the relative delicate quality of PTFE, it is normal that its heap conveying capacity and its wear opposition may be expanded by the expansion of reasonable fillers. As needs be, a few fillers attempted in blend with this plastic including graphite, fiber glass, dental silicate, silicon, titanium of dioxide, silver, copper, tungsten and molybdenumdisulphide.

II. LITERATURE REVIEW

Koji Kato et al explained the Soft or hard film coating, multi-phase alloying and composite structuring have been developed to control wear and friction by improving materials and surfaces with some aspects for better properties of friction and wear. On the other hand, it is well recognized recently that the coefficients of friction and wear are not material properties but two kinds of responses of a tribo-system. They are always reasonably related with each other when the necessary functions of the tribo-system are well considered. Typical wear behaviors of representative materials of coatings, composites, metallic alloys and ceramics are reviewed in relation to their friction behaviours, and fundamental mechanisms of wear are confirmed for the technical development of wear control. Friction and wear are responses of a tribo-system. Friction and wear, as two kinds of responses from one tribo-system, must be exactly related with each other in each state of contact in the system, although a comprehensive simple relationship should not be expected. The purpose of this paper is to come to the general understanding of wear mechanisms by reviewing the characteristics of wear and friction of very different materials. For the technical development of wear control in the near future, the characteristics of wear of coatings, composites, metallic alloys and ceramics were reviewed in relation to their frictional characteristics.[1]

David L. Burris et al, explained in this paper PEEK filled PTFE composite that exhibits low friction and ultra-low wear. The lowest average friction coefficient of $\mu = 0.111$ was obtained for three samples having a PEEK wt. % of The composite has a wear rate lower than unfilled PTFE and PEEK for every sample tested. The lowest wear rate of $K=2\times10^{-9}$ $mm^3/$ (Nm) was obtained for a 32 wt. % PEEK filled sample. This sample was 900 times as wear resistantas the unfilled PEEK and 260,000 times as wear resistant as the unfilled PTFE. Samples having PEEK content greater than 32 weight% had no wear transients. The wear rates were observed to increase with increasing PEEK content approaching that of unfilled PEEK.[2]

Talat Tevrüzet al, explained in this paper the coefficient of friction and the wear are strongly influenced by the thickness and composition of these films depending on the adhesion between steel and composite surfaces, the cohesive properties of the polymer used, pressure and the sliding distance. Taking into consideration the large number of factors, and their widely fluctuating characters and effects on