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AN EXPERIMENTAL INVESTIGATION OF FRICTION AND WEAR CHARACTERISTICS OF POLYOXYMETHYLENE (POM) DURING DRY AND WET SLIDING CONDITIONS

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Abstract

This paper presents experimental results of testing of Polymer- POM (Polyoxymethylene) that exhibits low friction and low wear rate under various contact pressure and velocities in dry and wet sliding conditions. The friction and wear behavior of polyoxymethylene are determined by using a TR20 (Tribometer) i .e. Pin and disc type wear tester. Special attention is focused on the effect of dry condition and wet condition on the coefficient of friction and specific wear rate. Counter surface consist of a disc of En8 material with 0.84µm surface roughness and 72 HRC surface hardness. During the testing, sliding velocities are 0.5 m/s ,1.0 m/s, 2.0 m/s and contact pressures applied on pin are 0.303 Mpa, 0.419 Mpa, and 0.536 Mpa. Duration of each test is 60 minutes. During testing ambient conditions was $22-25^{0C}$ temp.and RH = 60-65%. Mechanical and chemical analysis is also carried out to know the properties of the material under test. Experimental testings are carried out and results are compared for different contact pressures, velocity etc. The transfer film of POM is formed on the surface of the steel counterpart. The friction coefficient of POM thus reduced remarkably and anti-wear property got greatly improved by the use of lubricating oil.

Keywords: Tribometer, Polymer, POM, wear, friction coefficient, specific wear rate.