Statistical Approach to the Cellulose Nanocrystal Tribological Behavior on the Piston Liner Contact Using Full Factorial Design (FFD)

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Abstract The primary goal of this research is to investigate the effect of tribo-test parameters on the coefficient of friction (COF) and wear rate of the cylinder liner and piston ring pair. The tribological studies are carried out utilizing a full factorial design (FFD) experimental scheme. Sliding speed, temperature, volume concentration, and applied force were all evaluated as important parameters that determine tribological qualities. The effects of various variables and their interactions on the dependent variables were investigated. The ANOVA analysis demonstrates that the applied load could be the most influential factor affecting the minimum amount of the friction coefficient. The minimum quantity of wear rate indicates that as the sliding speed increases, the wear rate decreases.

Keywords Cellulose nanocrystal (CNC) · Additive · Tribological properties · Piston skirt liner · Engine oil

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