

Effect of TMP-based-cottonseed oil-biolubricant blends on tribological behavior of cylinder liner-piston ring combinations

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Abstract

Cottonseed oil-based biolubricant was synthesized by the TMP-based transesterification process. 10-50% by volume blends of TMP-based cotton-biolubricant and SAE-40 were prepared and tested on the high-frequency-reciprocating-rig with engine cylinder-liner and piston-ring combination to investigate their tribology. While tribological characteristics were also evaluated by four-ball tribo-testers at high constant load of 785 N. 10% addition of cotton-biolubricant showed the lowest friction and wear as compared to SAE-40 but > 10% volume of cotton biolubricant in blend increased the wear and friction considerably as tested by both HFRR and four-ball. Hence, 10% addition of TMP-cotton-biolubricant can be utilized as an energy-saving lubricant additive to partially reduce the dependency on petroleum-based lubricant for automotive engine application.

Keywords

Author Keywords: Cotton-biolubricant; COF; Wear; Engine cylinder-piston ring

KeyWords Plus: BIO-LUBRICANT; FRICTIONAL BEHAVIOR; VEGETABLE-OIL; WEAR

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