

# Synergistic effect of molybdenum disulphide and butylated hydroxytoluene in lithium complex grease

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## ABSTRACT

Lubricating grease is vital as a sealant and provides extra protection for automotive parts, such as bearings. Bearings are subjected to friction and sliding wear, which results in the degradation of automotive or machinery performance. The present article analysed the effect of molybdenum disulphide ( $\text{MoS}_2$ ) and butylated hydroxytoluene (BHT) as grease additives in reducing the frictional and wear behaviour of steel ball bearings. The experiment was conducted by preparing two formulated lithium complex-based grease with a different blending of additives of BHT only (LCG 01/18) and  $\text{MoS}_2$  + BHT (LCG 01/5). The formulated greases were compared with two industrial greases as the controlled parameters. Next, the physical characterization of formulated and industrial greases was conducted which includes dropping point test (ASTM D2265-00), cone penetration test (ASTM D217-02) and oil separation test (ASTM D6184-17). Then, the four-ball test (ASTM D2266-01) was performed to identify the effect of additives on the wear and frictional coefficient behaviour. The blending of  $\text{MoS}_2$  and BHT improves the physical characterization of grease in terms of dropping point and oil separation. The blending of  $\text{MoS}_2$  and BHT also helps to decrease the wear diameter and frictional coefficient. Nonetheless, further study is desired to gain a thorough understanding of the processes so that an optimal system can be developed for the industry.

## KEYWORDS

Butylated hydroxytoluene; Friction; Lithium complex grease; Molybdenum disulphide; Wear

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