# Grease Lubricity in the Fretting Contact

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A statistical energy-based approach is employed to experimentally characterize the ability of different greases to reduce friction when a point contact is subjected to repeated reciprocal displacements smaller in magnitude than the contact diameter. These fretting conditions allow the assessment of lubricant performance with regards to its ability to remain in the contact and boundary layer lubrication properties. The incipient wear after a thousand fretting cycles is also studied. Results indicate that composition dependent boundary layer lubrication properties of greases loaded with non-halogenated ionic liquids containing bis(oxalato)borate ([BOB]) and bis(mandelato)borate ([BMB]) anions can result in no detectable wear and low friction, at least throughout the duration of these tests, even in conditions where the original contact area is never fully uncovered, moderately high pressures are present, and traditional additives such as zinc dialkyldithiophosphate (ZDDP) show underwhelming performance.

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