

In this research friction and surfaces wear of machine elements under fully submerged oil conditions at different load and different contaminant concentration has been studied using a high frequency reciprocating rig (HFRR). The results show that the presence of solid particles in the lubricant disturbs the proper operation of the oil film leading to noticeable fluctuations of film thickness and higher friction coefficient. Under these conditions, friction is elevated compared to its behavior in the absence of contaminants. In addition, the presence of solid particles with temperature variation leads to oil film reduction and as a consequence the friction increases. For a better understanding of wear phenomena in contaminated media, optical microscope images were taken for a steel ball. Results show severe abrasive wear in a purely sliding contact. The wear is accelerated with the presence of sand particles and with a temperature increase.