

## **Evaluation of palm oil methyl ester as lubricant additive using milling and four-ball tests**

### **Abstract**

This paper examines the effectiveness of POME (palm-oil methyl ester) as lubricant additive based on the results obtained in the four-ball and milling tests. The results produced in the four-ball tests showed that small amount of POME as an additive in the mineral oil resulted in shorter running-in period, lower steady-state friction coefficient and degree of adhesion, and higher weld load. The presence of POME enhanced the effectiveness of the mineral oil in suppressing coating delamination and delaying the occurrence of cracking and fracture on the flank face of the tool during milling of stavax® (modified 420 stainless steel). The results obtained in the four-ball tests suggested that this was due to a reduction in the cutting forces and lesser degree of welding of asperities brought about by the presence of POME.